The Dissertation Committee for Jae Hak Jung Certifies that this is the approved version of the following dissertation:

A Cross Cultural Investigation of Cognitive, Metacognitive and Motivational Factors Affecting Student Achievement

Committee:

Claire Ellen Weinstein, Supervisor

Diane L. Schallert

Marilla D. Svinicki

Susan N. Beretvas

Alexa M. Stuifbergen

A Cross Cultural Investigation of Cognitive, Metacognitive and Motivational Factors Affecting Student Achievement

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Jae Hak Jung, B.A.; M.A.

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A Cross Cultural Investigation of Cognitive, Metacognitive and Motivational Factors Affecting Student Achievement

Jae Hak Jung, Ph. D.

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Supervisor: Claire Ellen Weinstein

My goals for this study were to use Structure Equation Modeling (SEM) to: propose a conceptual model based on theoretical frameworks of student motivation variables, use of c ognitive strategies, and use of self-regulation strategies affecting student academic performance; statistically examine each of the structural relationships among the above variables on student achievement; and, test for cultural differences between American and Korean community college students on the measurement model, factor means, and structure model.

These SEM results provided support for four research hypotheses: (a) Students' reported motivational variable scores had significantly positive effects on students' reported use of self-regulation strategies for both the American and Korean community college students; (b) Students' reported motivational variable scores had significantly positive effects on students' reported use of cognitive strategies for both the American and Korean community college students; (c) Students' reported motivational variable scores significantly positively predicted students' academic achievement for both the

American and Korean community college students; (d) Students' reported use of cognitive strategies was positively related to students' reported use of self-regulation strategies for bo th the American and Korean community college students. However, these results did not provide st atistical support for the four research hypotheses; (e) Students' reported use of cognitive strategies did no t significantly predict students' academic achievement in the overall model for both the American and Korean community college students; (f) Student's reported use of learning skills strategies did not significantly predict students' academic achievement in the overall model for both American and Korean community college students.

Based on the results of the current study, many future studies can be suggested. First of all, future studies need to have various measurements to assess student academic achievement. GPA is only one measure for students' academic achievement or success. Future research should consider alternative measurements such as peer or teacher evaluation, students' satisfaction, problem-solving ability i n the context of the course student are taking, ability to transfer and so on. If research includes more alternative measurements to measure student success, research may avoid the limitation of using only GPA as student success.

Table of Contents

List of Tables

List of Figures

Chapter 1

Introduction

There are a number of researchers examining factors affecting students' higher education access, successful transition to college, academic success, and student retention. Particularly, the majority of researchers have tended to focus on predictive individual, familial, sociological and prior educational achievement variables, such as parents' education levels, socioeconomic status and prior school achievement. Although it is important to identify these predictor variables for academic success to help identify at-risk college students, we cannot change students' prior history. Therefore, it is also crucial to use diagnostic and prescriptive measures to assess students' cognitive, metacognitive, and motivational variables that affect students' academic achievement and retention. By expanding the research on the effects of these variables on students' achievement and retention, this current study could not only lead to helping students improve their use of their learning strategies but also to encouraging students to build greater motivation and abilities to monitor their learning processes to enhance academic success and retention.

Most studies of student learning processes have focused on using only one variable or a small set of variables that affect a student's learning achievement. However, it is the interaction among cognitive, motivational, metacognitive and self-regulative processes that appear to contribute to academic success (Nota, Soresi, Zimmerman, 2004; Pintrich , 1999; Pintrich , 2004; Pintrich & De Groot, 1990; Schunk & Zimmerman, 2008; Weinstein, Acee, & Jung, 2010; Zimmerman, 2002).

Therefore, it is necessary to have a broad theoretical perspective to help explain the effects of a number of strategic learning elements and the interactions among them that tend to account for a significant amount of the variance in students' learning achievement. One theoretical perspective that includes these different elements is summarized in Weinstein's Model of Strategic Learning (MSL).

Weinstein's Model of Strategic Learning focuses on the interactions among a number of cognitive, metacognitive, motivational, and self-regulation variables that foster student success. Weinstein and her colleagues (2006) suggest that strategic learners should have the skill, will and self-regulation to be autonomous learners in different academic or training environments. Skill refers to knowing what to do (i.e., knowing about a variety of strategies, such as strategies for taking good notes) and how to do it (e.g., being able to take good notes). Will refers to the motivation and affective components that either contribute to or detract from academic success (e.g., coming up with goals to help you succeed in a difficult course; using future time perspective and goal hierarchies to generate motivation contribute to learning while anxiety and self-sabotaging beliefs detract from learning). Self-regulation is the capacity to control or manage one's own learning (e.g., time management and an instrumental approach to help-seeking). Each individual component of the model (see Figure 1, page 12) can impact student success. In addition there are interactions among elements in the three primary components that result in more effective and efficient learning.

Similarly, Pintrich (2004) describes self-regulated learning (SRL) as an active, constructive process whereby learners set goals for their learning, plan actions and

monitor their success, as well as regulate and control their cognition, motivation and behavior. These actions are guided and constrained both by their goals and contextual framework and also mediate the relationships among individuals, the learning context and learners' academic achievement.

Based on these theoretical frameworks, there are several laboratory and field researchers investigating the important roles of students' use of cognitive, metacognitive, motivational, and self-regulation strategies for achievement (i.e., Berger & Karabenick, 2010; Cornford, 2002; Hofer & Yu, 2003; Liem, Lau & Nie, 2008; Pintrich & de Groot, 1990; Vrugt & Oort, 2008; Weiner, 2000; Weinstein, Husman, & Dierking, 2000; Weinstein & Mayer, 1986; Zimmerman, 1990, 1994 ; Zimmerman & Schunk, 2008). For instance, Zimmerman (1994) found that comprehensive use of motivational, and self-regulation strategies predicted students' overall academic grades as well as students' verbal ability measures on their outcomes in writing. Zimmerman (1990) also determined that student motivational beliefs (such as self-efficacy and Self-regulation strategies) can be significant predictors of academic performance and also that these motivational variables can impact use of learning strategies. Tanner and Jones (2003) also reported that learner's goal orientation (motivation) was positively related to their use of cognitive strategies as well as self-regulatory strategies. Recently, researchers have developed specific models to identify the relationship among specific subsets of cognitive, metacognitive, motivational, self-regulation strategies and academic achievement and test these proposed models. For instance, Liem et al (2008) examined the role of self-efficacy, task value, and achievement goals in students' use of learning

strategies, task disengagement, peer relationships, and English achievement outcomes using structural equation modeling (SEM).

Furthermore, based on the Model of Strategic Learning, the learning strategies course at The University of Texas at Austin (UT) has been successful at helping students become more strategic and self-regulated learners and persist to graduation (Weinstein, Taylor, & Jung, 2010). UT first-year students were tracked for 5 years in order to compare graduation rates of students who took the Learning Strategies course to a statistically matched sample of students who did not (selected from the general student population). Students who did not take the course had a 5-year graduation rate of 55%, which was typical for UT students at the time. Despite having significantly lower SAT scores, students who took the Learning Strategies course, in either the first or second semester of their first year, had a graduation rate of 71% (Weinstein et al., 2000).

Weinstein's Model of Strategic Learning will be used as the theoretical framework in this dissertation study. This study's focus was on the effect of cultural context on students' reported use of strategic and self-regulated learning methods. Generalizations from prior research might not hold for different groups of students such as Asian, Latino, community college, 4-year college, and university students, where the dynamics among the variables in the model of strategic learning may be quite different.

Recent reports indicate that 58% of Hispanic students and 42% of White students are currently enrolled at 2-year colleges (Snyder, Dillow, & Hoffman, 2009). A majority of students begin their postsecondary education in community colleges (Chronicle of Higher Education 2001; Fry 2004; Nora, Rendón, & Cuadraz, 1999).

Similarly, in South Korea, almost 40% of post-secondary students were enrolled at community colleges (Yoon, Park, Yoon & Lee, 2009). There still remain many questions regarding the determinants of college success for the populations entering community colleges in both countries (Robbins, Lauver, Le, Davis, Langley & Carlstrom, 2004). Several researchers (e.g., Hoachlander, Sikora, & Horn, 2003; Lai, 2008; Lee & Frank, 1990; Nakajima, 2008; Roueche & Roueche, 1993) reported that the characteristics of community colleges students are different from four years college students. Many students attending community colleges are unprepared for college learning (Community College Survey of Student Engagement, 2007). These students are often considered to be at high risk for academic failure, are frequently of low socioeconomic status, and are often first generation college attendees (Hoachlander et al, 2003; Nakajima, 2008). More specifically, Hoachlander et al. (2003) reported that more than 60% of students who began their studies at community colleges possessed insufficient skills for doing college level coursework.

In spite of these significant differences between four-year college students and community college students, since most of these theoretical concepts have been studied and developed among four-year college students, their relevance to community college students has been questioned. However, there are a few researchers investigating the important role of cognitive, metacognitive, motivational, and self-regulation strategies, motivational beliefs and socio-economic variables in student academic success in community college settings.

Another problem with the research in this area is that generalizations in past research may not hold across different cultures in other countries. A number of researchers have already found that a wide range of educational and cultural variations could contribute to differences in student motivation and strategic learning strategies of Western and Asian students (Lihong, 2010; Purdie & Hattie, 1996, 2010). For example, East Asians have been found to place a high value on education, emphasize the role of effort in achievement, hold high standards and aspirations, and devote more time to academic work (e.g., Chen & Stevenson, 1989; Dunn and Wallace, 2004; Stevenson, Lee, Chen, Lummis, Stigler, Fan, & Ge, 1990; Stevenson, Lee, Chen, Stigler, Hsu, Kitamura, & Hatano, 1990). However, East Asian students were also found to have less autonomy in their learning than Western students. Iyengar & Lepper (1999) and Boekaerts (2003) determined that Western children showed more intrinsic motivation when they made their own choices about their learning situations. In contrast, it has been shown that Asian children were most intrinsically motivated when choices were made for them by parents or other trusted, authorized persons; therefore, when Asian students go to college and there is no motivational pressure from parents and teachers, they are likely to have difficulty maintaining their own learning with higher intrinsic motivation.

Cultural differences regarding individualism-collectivism may also be reflected in differences of Western and Asian students in their learning. According to Purdie & Hattie (1996), Western students have been viewed as active in their learning approaches. They have been characterized by independence, self-confidence, and a willingness to find

a way to solve issues and develop alternative ways to thinking. In contrast, Asian students have been viewed as passive learners, exhibiting compliance, obedience, and a concern merely to memorize information rather than to understand it. Therefore, it is highly possible that there are differences in using cognitive, metacognitive, motivational, and self-regulation strategies between the two groups (e.g., Klassen, Usher, & Bong, 2010) found that more Asian college students have difficulty with time management than do Western students). Nevertheless, there are few researchers investigating cultural differences in the comprehensive use of motivational, self-regulation, and cognitive strategies. Accordingly, there is no study comparing models to explain how those variables interact to affect student academic achievement.

In sum, most research on how motivational, self-regulation, and cognitive strategies influence student academic achievement has been conducted in North American settings (Schunk, 2005). Because there is little research examining cultural differences in student motivation and learning skills individually or with respect to factors related to college student success there is a clear need for more cross-cultural research and research for ethnically diverse populations. Therefore, we need to conduct more research that examines different populations within western cultures as well as cross-cultural research that tests the generalizability of previous research.

The purpose of the current study was to propose and test a conceptual model encompassing theoretical frameworks of student demographic, cognitive, self-regulation, and motivational variables affecting student academic achievement between American students and Korean students in community colleges.

As a first step, I have examined cross-cultural differences in those variables affecting student academic achievement between American and Korean community college students. I have tested measurement invariance, factor mean difference, and structure invariance between two groups. I expected to find that American community college students are more motivated than Korean community college students. In addition I expected to find that American community college students are more likely to use actively self-regulation strategies such as time management, self-testing, and concentration than Korean students. However, there is still controversy among researchers about whether these differences in use of cognitive learning strategies actually exist between these cultures. A number of researchers say their research shows that Western students use more actively cognitive learning strategies such as elaboration and organization, for deep learning than Asian students (Marton, Dall'Alba, & Tse, 1996; Purdie & Hattie, 1996). On the other hand, in other empirical studies the researchers concluded that Asian students do not significantly differ from Western students in using cognitive learning strategies (Ling, Arger, Pallant, Chua, & Yin, 2004; Ramburuth, 1997, 2002). Therefore, the current study helps to address this controversy.

Second, I explored the relationship among the demographic, cognitive, self-regulation, and motivation variables, and academic achievement, and whether those differ by culture. I have examined the usefulness of the Model of Strategic Learning (Weinstein et al, 2006) with two community college student groups. I predicted there are differences between American and Korean community college students in how each element are related with other elements and affect student success. For example, family

income can be an important predictor for student motivation and academic achievement for American community college students. On the other hand, this family income predictor can be less likely to predict Korean student motivation and achievement (Chiu & Xihua, 2008). My hypotheses were partially examined in the study. I have conducted Multiple Groups Structural Equation Modeling (MG-SEM) to form a general model of how each variable directly and indirectly affects student success. This helps to investigate whether this general model suits both American and Korean community college students and whether these relationships are invariant across groups differing by culture.

Currently, as a researcher on the Community College Longitudinal Research study (CCLR), directed by Dr. Claire Ellen Weinstein, I and other colleagues have collected extensive data on these variables cited above with a community college in San Antonio, Texas. Through this research we found that several demographic factors, motivational variables, self-regulation variables and cognitive learning strategies can significantly impact community college student academic achievement and retention. I wanted to extend this research to Korean community college students in this dissertation study.

More specifically, I have already conducted survey research using an extensively developed Korean version of the Learning and Study Strategies Inventory (LASSI), and measures of self-determined motivation, self-efficacy and help-seeking, as well as a demographic information questionnaire collecting data on age, sex, family income, and parent education in the beginning of the semester with Korean first-year students.

Students' GPA data to measure student academic achievement was also collected after the semester. This cross-cultural research compared students' demographic, cognitive, metacognitive, and motivational variables affecting student academic achievement, between American students and Korean students enrolled in community colleges in the United States and South Korea.

The most important finding of the study is that the current research model encompassing theoretical frameworks of students' cognitive, self-regulation, and motivational variables affecting student academic achievement is strongly applicable to both American and Korean community college students (see figure 2, page 12). More specifically, this study showed that student motivation was a significant predictor of students' reported use of cognitive strategies as well as self-regulation strategies for both American and Korean community college students. In addition, student motivation significantly positively predicted student academic achievement for both groups. However, students' use of cognitive strategies and self-regulation strategies did not significantly predict student academic achievement for both groups.

This research also showed several cross-cultural differences in students' use of cognitive strategies, self-regulation strategies and motivation. I found that American students have higher scores on motivation and use of cognitive and self-regulation strategies. These results can be considered as evidence of cross-culture differences in community college student learning.

This dissertation contributes to both generalize and specialize our research results to suit several different learning settings. It could also be useful in forming a general

model showing how each variable directly and indirectly affects student success. By investigating these student variables that both contribute to and protect against negative achievement outcomes in different learning environments, we can generate a database of assessments and potential interventions that could be used in educational programs in different learning contexts.

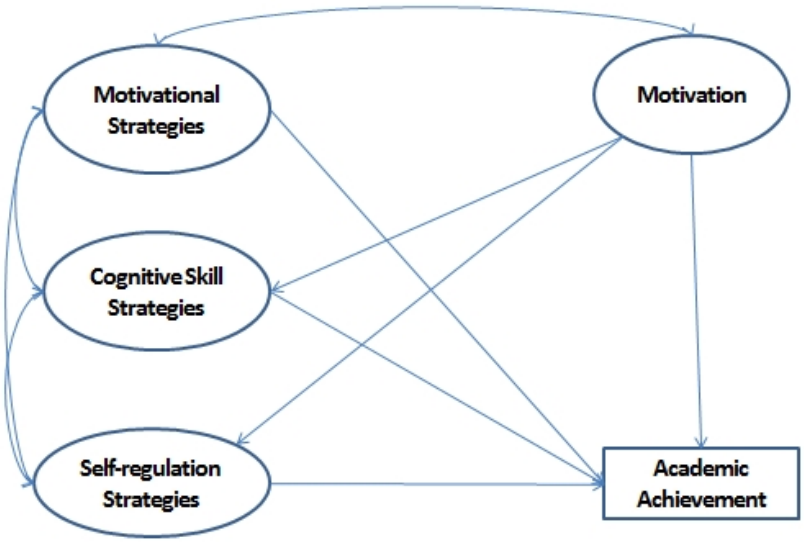

Figure 1 Original model for this research

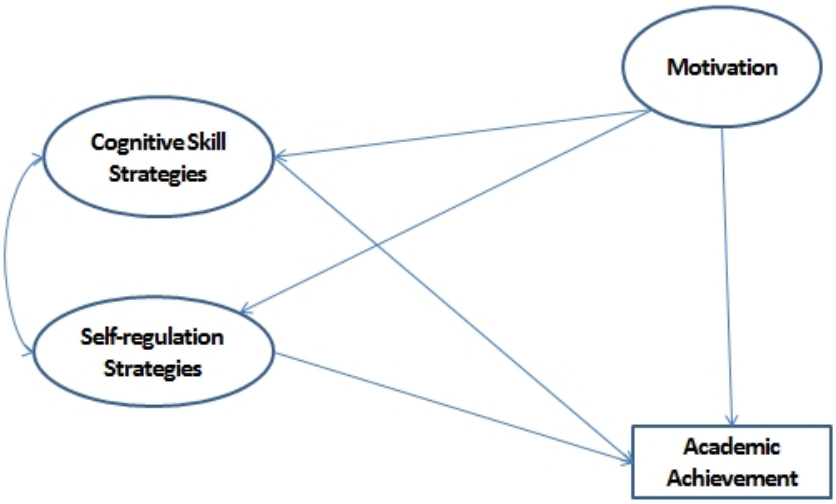

Figure 2 Final model for this research

Chapter 2

Literature Review

Introduction

Most literature examining factors affecting higher education access, the transition to college, student academic success, and retention has tended to focus on predictive individual, familial, sociological, and prior educational achievement variables, such as parents' educational levels, socio-economic status, and prior school achievement. Although it is important to identify these variables for academic success, it is also crucial to use diagnostic/prescriptive measures that assess student cognitive, metacognitive, and motivational variables affecting student academic achievement and retention (Weinstein, Timberlin, Julie, & Kim, 2004). A number of studies exist that investigate individual variables affecting student academic achievement or retention (e.g., DeBerard, Spielmans, & Julka, 2004; Gifford, Briceño-Perriott, & Mianzo, 2006). However, recent conceptual models stress the importance of identifying the dynamic relationships among these variables. In addition, most previous research has focused on American white middle-class students in a fairly traditional academic setting. This research might be even more useful if it focused on cultural and contextual constraints on these generalizations.

Thus, it is important to consider that these generalizations might not hold for some groups of students (e.g., Asian, Latino, community college) where the dynamics among variables may be quite different. A number of researchers have already reported

that a wide range of educational and cultural differences could contribute to differences in student motivation and strategic learning strategies of Western and Asian students (Purdie & Hattie, 1996). For example, East Asians have been found to: place a high value on education, emphasize the role of effort in achievement, hold high standards and aspirations, and to devote more time to academic work (e.g., Chen & Stevenson, 1989; Stevenson et al, 1990; Stevenson, Lee, Chen, Stigler, Hsu, & Kitamura, 1990). The West-East cultural differences regarding individualism-collectivism may be also reflected in differences of Western and Asian students in their learning. According to Purdie and Hattie (1996), Western students have been viewed as rather active in their learning approaches. They have been characterized by independence, self-confidence, and a willingness to find a way to solve issues and develop alternative ways of thinking. In contrast, Asian students have often been viewed as passive learners, exhibiting compliance, obedience, and a concern merely to memorize information rather than to understand the material they are learning. Finally, most cross-cultural research about factors related to college student success is focused on four-year colleges and there may be significant distinctions between students at a four-year and a two-year college. There is a clear need for more research that examines different populations within western cultures as well as cross-cultural research that tests the generalizability of previous research.

Overview of Learning Strategies Theory and Assessment

Learning strategies have slightly different definitions depending on research areas and domain of applicability. However, fundamentally, there is general agreement that

learning strategies involve the use of cognition, self-regulation, motivation, metacognition, and behavior to help learners succeed in learning, including memorizing, understanding, and performing higher order cognitive tasks (Schunk & Zimmerman, 2008, Weinstein, Acee, & Jung, 2011). In the educational psychology area, learning strategies can be defined as cognitions, behaviors, attitudes and beliefs of a learner that are intended to influence the encoding processes and facilitate acquisition and retrieval of new information (Weinstein & Mayer, 1986; Weinstein, Husman, & Dierking, 2000; Weinstein et al, 2004). Examples include underlining key ideas in a passage, outlining the ideas presented in a lecture, implementing/monitoring a plan to summarize each section of a textbook, trying to put some newly learned information into one's own words, and using one's prior knowledge to help build bridges between what the person knows, or has experienced and what the person is trying to learn, and applying a new principle in different types of problems.

Researchers and educators, particularly in higher education, have become increasingly interested in teaching general learning strategies and study skills and a number of programs have been developed to that effect (Chipman & Segal, 1985; Weinstein et al., 2004). In addition, they also have investigated how the use of effective learning strategies and study skills promotes student learning and can lead to improvements in learning achievement (Kulik, Kulik, & Schwalb, 1983; McKeachie, Printrich, and Lin, 1985; Weinstein et al., 2004). The data gathered from these studies and applications has raised questions about both past and current study skill and learning strategies research and interventions. A first issue is the identification and definition of

the types of learning strategies and study skills to be taught. This issue is very important because the field will have difficulty progressing without addressing this issue. Therefore, a number of researchers have tried to find specific learning strategies and skills that influence students' academic achievement and they have developed conceptual models of learning strategies based on simple main effects or individual instructional components. The specific definitions researchers have used to explain learning strategies and study skills have varied, but there are relatively reliable learning strategies definitions and models that I used in this discussion.

In terms of conceptions of learning strategies, Weinstein and her associates developed a Model of Strategic Learning, refined in 1999, 2004, and 2006, that captures much of the current thinking, research results, and application data in this area (Weinstein, Dierking, Husman, Roska, & Powdrill, 1998; Weinstein et al, 2004; Weinstein, Acee, and Jung, 2011). In Weinstein's model, there are four major components and a number of individual elements in each component (see Figure 3). The four major components are: skill, will, self-regulation, and the academic environment. To be successful in academic learning situations, learners should have good skills. Skill involves knowing what to do (for instance, knowing about a variety of learning strategies, such as relating new material to prior knowledge either directly or by analogy) and knowing how to do something (for instance, being able to relate prior knowledge and using analogies to learn new things). However, knowing about and using learning strategies and study skills are not enough to succeed. Learners also need to have the will or desire to want to use these skills, and they should have the belief that

they can use these skills and be successful, which is the second component of the model - motivation. Learners also need to be self-regulated to manage their own learning. Self-regulation, the third component, can be defined as the capacity to control or manage one's own learning. Important parts of self-regulation are developing useful learning goals and exercising control, or taking action, to reach one's learning goals, as well as using a systematic approach to studying and useful forms of help-seeking. For instance, students should know how to manage their time for completing different academic tasks so they can reach their learning goals successfully. Finally, learners also need to know and understand their academic environment. Even though students cannot usually control their learning situation, they need to understand their learning environment, such as teachers' expectations for successful performance in their class, so they can use their learning skills and adapt to the needs of the learning situation (Weinstein, et al., 2004).

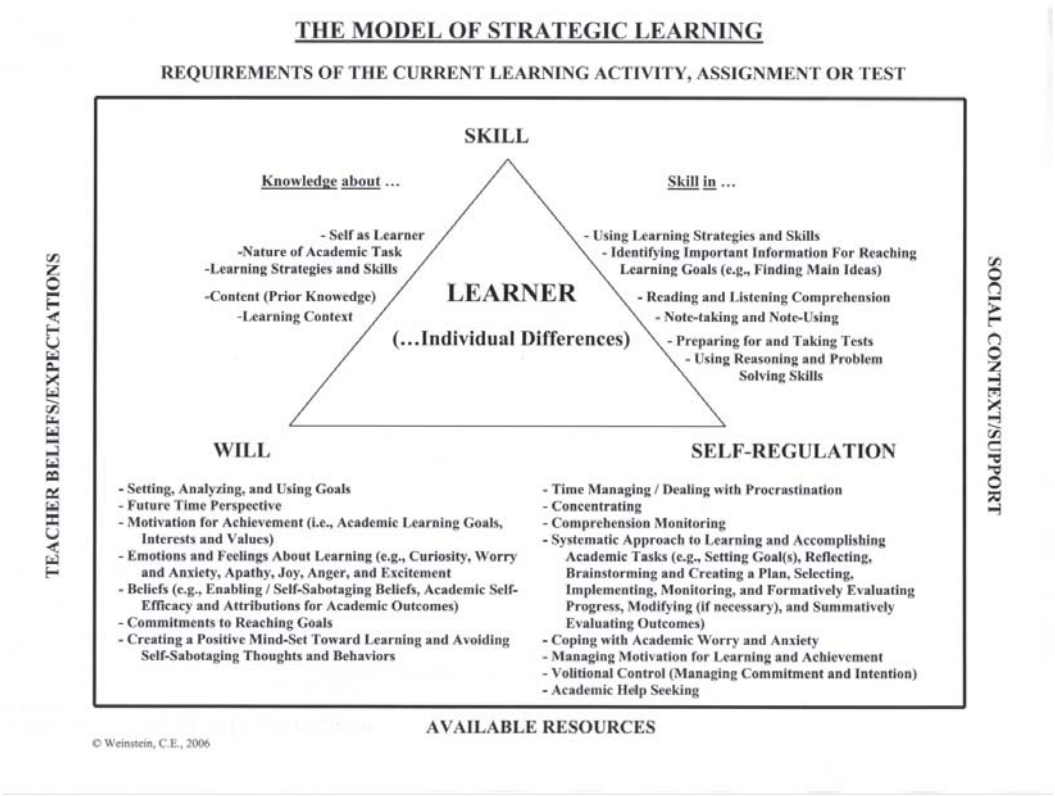

Figure 3 Weinstein's Model of Strategic Learning (2004)

The Model of Strategic Learning depicts these four major components (skill, will, self regulation and the academic environment), and each major component contains several elements: the skill component contains elements such as information processing, selecting main ideas and test taking strategies; the will component includes elements such as anxiety, attitude and motivation; self-regulation contains elements such as concentration, self-testing, study aids, and time management; and the academic environment component includes elements such as teacher expectations, the nature of academic tasks and available resources. Using this Model of Strategic Learning, a number of interventions have been developed to help students at diverse institutions

become more strategic and self-regulated learners. These range from creating learning center handouts to relatively brief workshops to semester-length courses such as the "Individual Learning Skills Course" in the Department of Educational Psychology at the University of Texas.

Zimmerman and Martinez-Pons (1986) also proposed a model that included 14 categories of self-regulated learning strategies that high school students should use during class and when studying. These strategies include: self-evaluation, organizing and transforming, seeking information, goal-setting and planning, keeping records and self-monitoring, environmental structuring, self-consequences, rehearsing and memorizing, seeking peer, teacher, or adult assistance, and reviewing notes, tests, and textbooks. Students' use of these strategies was highly correlated with their achievement and with teachers' ratings of their self-regulation in a class setting. Through follow-up studies, it was determined that students' reports of their use of these self-regulated learning strategies predicted their achievement behavior in school with 93% accuracy, and 13 of the 14 strategies discriminated significantly between students from the upper achievement track and students from lower tracks (Zimmerman & Martinez-Pons, 1988; Zimmerman, 1989). The self-regulated learning strategies described by Zimmerman (1989) encompass three classes of strategies that all students use to improve self-regulation of their (a) personal functioning; (b) academic behavioral performance; and (c) learning environment.

There is the need for good inventories to assess certain aspects of students' knowledge and use of learning strategies. There has recently been an upsurge in interest

in measuring the learning strategies of students in higher education because it is important to know about the strengths and weaknesses of individual students so that instruction may be adapted to help students meet their individual goals. This is particularly true for students who are at-risk for low achievement or failure in college. There are several instruments that do sample across several learning components and skills. For example, the Study Behavior Inventory (Bliss & Meuller, 1987) measures students' attitudes toward studying, their study behaviors, and their coping mechanisms for taking examinations. The Cornell Learning and Study Skills Inventory (Pauk & Cassel, 1971) examines students' study skills, goal orientation, and self-mastery. Most recently, the two most commonly used measures of students' learning strategies and study skills are the Learning and Study Strategies Inventory, 2nd Edition (LASSI) (Weinstein, Schulte, & Palmer, 2002) and the Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich, Smith, Garcia, & McKeachie, 1991).

Weinstein and her colleagues (Weinstein & Mayer, 1990; Weinstein & Palmer, 2002) developed the Learning and Study Strategies Inventory (LASSI) based on Weinstein's Model of Strategic Learning and linked the inventory development directly to a program of training for all of the components of the model. The LASSI covers a wide of range of learning strategies typically found in learning strategies training and is supported by the developing ideas about learning processes (Entwistle & McCune, 2004). The LASSI is a 10-scale, 80-item assessment of students' awareness about and use of learning and study strategies related to skill, will, and self-regulation components of strategic learning. The LASSI has been shown to be a valid and reliable measure of

strategic learning (Weinstein & Palmer, 2002). The scores on each scale are converted to a percentile scale so that students' relative strengths and weaknesses as well as their relationship to national norms can be examined.

The Motivated Strategies for Learning Questionnaire (MSLQ) was developed from a theoretical model that brought together an information processing view of cognition with a social cognitive perspective on motivation by Pintrich and his colleagues (1991). Development of the MSLQ began in the early 1980s with the creation of a range of self-report instruments designed to evaluate the effectiveness of a "learning to learn" course, and continued subsequently through psychometric analyses and by investigating predictive relationships with students' grades (Pintrich, Smith, Garcia, & Mckeachie, 1993). Besides being a research and evaluation tool, the MSLQ has been used by both students and faculty to enhance student learning (Pintrich & Garcia, 1994). There are other instruments that have been designed to measure learning strategies, and they each have advantages and disadvantages. However, there is still a need for additional methods of assessing student learning skills, particularly in different content domains. The LASSI and MSLQ stress strategic learning across domains of study but do not have versions for specific content areas such as math or science.

Research supporting learning strategies theory and practice

Several studies have shown that learning strategies predicted academic performance, suggesting that the use of learning strategies is essential for better academic performance. Researchers have already found that these variables are highly correlated with students' academic achievement at both the high school and college levels.

There are a number of laboratory and field studies that have examined the effect of learning strategies including students' cognitive, metacognitive, motivational, and self-regulation strategies on academic learning achievement (i.e., Berger, & Karabenick, 2010; Cornford, 2002; Hofer & Yu, 2003; Liem, Lau & Nie, 2008; Pintrich & de Groot, 1990; Vrugt & Oort, 2008; Weiner, 2000; Weinstein et al, 2000; Weinstein & Mayer, 1986; Zimmerman, 1990, 1994; Zimmerman & Schunk, 2008).

Studies of cognitive learning strategies

Henk and Stahl (1985) meta-analyzed 14 studies of note taking and how note taking training affects achievement and found an average effect size of 0.34 for the treatment groups. In a study of reading and study skills, Sanders (1980) reported an effect size of 0.29. Haller, Child, and Walberg (1988) meta-analyzed 20 studies of cognitive interventions in reading skills and found an impressive average effect size of 0.71. Weinstein (1978) developed a diversified elaboration skills training program for ninth grade students. A variety of cognitive skills, learning task typologies, and stimulus materials were selected to provide the learners with guided practice in the use of elaborative mediational skills. This elaboration strategies training included cognitive skills such as sentence elaboration, imaginal elaboration, the creation and use of analogies, drawing implications, creating relationships, and paraphrasing. Weinstein analyzed the effects of this elaboration skills training program on students' learning and retention of both everyday and laboratory tasks and found it to be successful. Salmon (1985) reported positive effects of training programs in test-taking skills on students' academic achievement.

Studies of motivational learning strategies

Zimmerman (1994) found that comprehensive use of motivational and self-regulation strategies predicted students' overall academic grades as well as students' verbal ability measures on their outcomes in writing. Zimmerman (1990) also determined that student motivational beliefs (such as self-efficacy and self-regulation strategies) can be significant predictors of academic performance. Tanner and Jones (2003) reported that learners' goal orientation (motivation) was positively related to the use of cognitive strategies as well as self-regulatory strategies. Tuckman (2003) showed that a motivation training program that included overcoming procrastination, building self-confidence, and becoming more responsible can improve students' overall academic achievement. Liem et al. (2008) examined the role of self-efficacy, task value, and achievement goals in students' learning strategies, task disengagement, peer relationship, and English achievement outcome using structural equation modeling (SEM). A structural equation model showed that whereas task value predicted only mastery goals, self-efficacy predicted each of the three types of achievement goal (mastery goals, performance-approach goals, and performance avoidance goals). They also found that mastery and performance-approach goals were both positive predictors of deep learning and peer relationship, but performance-avoidance goals were a positive predictor of surface learning and task disengagement.

Study of self-regulation and meta-cognitive learning strategies

There are also several researchers who have shown the effect of self-regulation strategies on students' academic learning achievement. For instance, Zimmerman and

Schunk (2001) revealed that students who have good learning self-regulation strategies, such as setting better learning goals, implementing learning strategies efficiently and effectively, monitoring and assessing their goal progress better, and establishing a more productive environment achieved higher grades than students who have poor self-regulation strategies. Pintrich and De Groot (1990) also found that students' use of self-regulation strategies was positively related to students' cognitive engagement and performance. Bielaczyc, Pirolli, and Brown (1995) identified a set of meta-cognitive skills such as self-explanation and self-regulation strategies used by high performance students and developed an intervention to train students to use these strategies. They found that students in this instructional group showed significantly greater academic performance achievement than students in control group.

Learning strategies programs and courses

Building knowledge derived from research on learning strategies and developing learning strategies models are contributing to developing programs and courses to teach students learning strategies and skills more effectively. These programs and courses have aimed at enhancing motivation, cognitive skills, self-regulation skills, and study-related skills such as time management, and anxiety management. McKeachie et al. (1985) designed one course to teach both concepts of cognitive psychology and their applications as learning strategies. They reported that the course was substantially successful in affecting participating students' self-reported study habits and modestly successful in affecting achievement in later semesters. Hatties, Biggs, and Purdie (1996) identified learning strategies and study skills courses and programs that are likely to lead

to students' success. Using meta-analysis methods, they demonstrated that study skill intervention programs and courses, in general, do work most of the time and found positive associations between achievement and the use of a particular strategy or set of strategies learned from these programs and courses. Furthermore, based on the Model of Strategic Learning, the learning strategies course at The University of Texas at Austin (UT) has been successful at helping students become more strategic and self-regulated learners and persist to graduation (Weinstein et al, 2010). UT first-year students were tracked for five years in order to compare graduation rates of students who took the Learning Strategies course to students who did not (the general student population). Students who did not take the course had a 5-year graduation rate of 55%, which was typical for UT students. Despite having significantly lower SAT scores, students who took the Learning Strategies course, in either the first or second semester of their first year, had a graduation rate of 71% (Weinstein et al., 1997). Similar results have been duplicated using wait-list control and statistical matching.

In addition, most researchers assume that these components and elements interact in specific academic situations and that these interactions lead to effective and efficient learning (e.g., Everson, Weinstein, & Laitusis, 2000; Zimmerman & Martinez-Pons, 1988). However, there has not been enough research about these proposed interactions to examine these relationships clearly. Also, there are too many ways in which interactions might occur.

Motivation Theory and Research

Motivation, defined as the force that energizes and directs a behavior towards a goal (Baron, 1992; Pintrich & Schunk, 2002; Schunk, 1990; Schunk & Zimmerman, 2008), is a crucial element to the learning process. Regardless of differences in students' unique learning strengths and weaknesses, in order to succeed academically all students must be motivated to do the work that success requires. Several studies have shown a positive correlation between motivation and academic achievement (Busato, Prins, Elshout, & Hamaker, 2000; Meece, Anderson, & Anderson, 2006; Wang, Hartel & Walberg, 1993; Zimmerman, Bandura, & Martinez-Pons, 1992). Therefore, gaining knowledge of the factors that facilitate motivation to learn and achieve is critical for educators and researchers to help students be successful learners. Although there are many motivational theories, my study took theoretical perspectives in the areas of self-efficacy (Bandura, 1997), future time perspective (Husman & Shell, 2008; Nuttin & Lens, 1985) and self-determination theory (Reeve, Deci, & Ryan, 2004; Ryan & Deci, 2000) as areas that can influence college students' motivation and achievement in college courses.

Self-efficacy

Bandura (1982, 1989) has developed a social cognitive model of behavior that includes self-efficacy as a major construct. In his model, self-efficacy is defined as an individual's perception of capability to organize and execute the courses of actions required to attain designed types of goals (Bandura, 1986, 1997). In academic areas, students have efficacy beliefs about their capabilities, skills, and knowledge toward mastering academically related tasks, but also have outcome expectations such as what

grades they might receive on the tasks. Academic self-efficacy is a student's judgment of his or her capability to perform the skills and strategies, actions, with the persistence required for academic achievement (e.g., "Will I do well in my community college courses?" or "Will I be able to use the learning strategies needed to make an A in the course?"). According to self-efficacy theory, self-efficacy beliefs are an important factor affecting motivation in most areas of life including academia and career choice.

Students' self-efficacy beliefs, whether accurate on inaccurate, influence students' efforts in terms of the kind of effort students expend, how much students are able to maintain that effort over time, students' choice of activities and goals, the learning strategies students use, how students manage and regulate their learning, and how students handle learning problems or failures (Bandura, 1986, 1997; Usher & Pajares, 2009; Weinstein, 2007). For example, individuals with high self-efficacy tend to approach difficult tasks as challenges to develop themselves further rather than as threats to be avoided. Those with higher self-efficacy are more likely to select strategies that will help them to complete a task successfully (e.g., by utilizing elaboration and organizational strategies for reading a science textbook) whereas individuals with low self-efficacy tend to choose more rehearsal strategies (e.g., by re-reading a textbook or making note cards) because they do not think they can really make much sense of the material and learn it anyway.

There is also much evidence showing that students' self efficacy beliefs about performing academic tasks successfully can impact their success on these tasks (e.g., Chemers, Hu, & Garcia, 2001; Pajares & Miller, 1994; Zimmerman et al., 1992;

Zimmerman & Martinez, 1990). For example, Chemers et al. (2001) reported that first-year college students' self-efficacy was a strong predictor of their satisfaction and academic performance. Many researchers have found that there is a positive relationship between self-efficacy and students' academic achievement (Pajares, 2009).

Researchers have also found that students' self-efficacy beliefs positively influence their learning behavior and use of learning strategies (Printrich & De Groot, 1990; Schunk & Ertmer, 2000; Zimmerman, 2002; Zimmerman & Cleary, 2006). Students who have high self-efficacy use more cognitive, motivational, and self-regulation strategies, and work harder, persist longer and persevere more in challenging situations. More specifically, students with higher self-efficacy set higher goals and put more efforts toward achievement of these goals (Zimmerman et al., 1992). Students with high self-efficacy use more self-regulation strategies such as self-evaluation, self-monitoring, and help-seeking (Bouffard-Bouchard, Parent & Larivee, 1991; Klassen, Krawchuk, & Rajani, 2008; Zimmerman & Martinez, 1990; Zimmerman, 2000). When students have higher self-efficacy, they tend to use more cognitive strategies for their deep learning such as elaboration and organizational strategies (Liema, Lau, & Niea, 2008; Magogwe & Oliver, 2007).

Future Time Orientation

Future Time Orientation (FTO) can be defined as the degree to which and the ways in which the chronological future is integrated into the present life-space of an individual through a motivational goal-setting process (Husman & Lens, 1999). In terms of academic settings, future time orientation can also be defined as students'

feelings or beliefs about the relationship between the information that is presented in the courses they are taking and their future goals (Bembenutty & Karabenick, 2004). Several researchers in this area have discussed the importance of Future Time Orientation (FTO) and suggested that FTO should be included in a comprehensive account of motivation (e.g., de Bilde, Vansteenkiste, & Lens, 2010). Students who believe that the skills that they develop and content that they learn in a particular course will be useful in their professional careers exhibit high motivation, active use of learning strategies, and higher academic achievement. There have been several studies that investigated the relationship between FTO in a particular course and academic achievement as well as academic motivation (Brown & Jones, 2004, Husman & Lens, 1999). However, this concept of FTO is not only applicable for a particular course or program but also for college in general. Many college students in university or 4-year college settings experience a disconnection between the academic knowledge they are required to study and real-world knowledge. If they can clarify, expand, and elaborate on realistic goals and make the connections between strategies and knowledge for academic success and their future life goals, they will have high motivation for college success (Kasworm, 2003; Leondari, 2007). Recently, several researchers have investigated the degree to which students view their college experience and learning as important for helping them to reach their future academic and occupational goals, and FTO has been found to influence their motivation and success in college.

In addition, some researchers have also proposed that FTO can be incorporated into self-regulation of learning (Bembenutty & Karabenick, 2004; Miller, Greene,

Montalvo, Ravindran, & Nichols, 1996). Overall, research on FTO supports the view that students with a positive perception of the instrumentality of schoolwork to reach future career goals are more motivated for school tasks, make more use of effective learning strategies, work harder, and perform better at school (Phalet, Andriessen, & Lens, 2004). FTO gives us a more complete picture of student academic motivation, and my study incorporated FTO into a consideration of other learning variables with the goal of expanding our understanding of motivation variables and their impact on learning.

Self-determination

In order to succeed at college, students must accomplish their learning tasks that are important as well as interesting or fun. "Individuals must either be intrinsically motivated to perform these tasks, have internalized their importance to society, or they must be coerced" (Deci & Ryan, 2000). Self-Determination Theory (SDT) proposes that individuals who have their psychological needs met will either be motivated to accomplish important tasks because of their inherent worth to the individual (intrinsic motivation), in which case the individual is likely to have interest in the task, or because they perceive the task as valuable to their sense of self and their goal structure (internalized motivation) (Ryan & Deci, 2002; Ryan & Deci, 2000). In Deci and Ryan's (1990) conceptualization of SDT, the claim is that individuals will experience enhanced self-motivation and healthy psychological development when three innate psychological needs are satisfied: competence, autonomy, and relatedness.

Usually autonomy refers to independence and to one's own authority as distinguished from others' authority. However, in self-determination theory, autonomy

refers to the individual's perception that he or she has the ability to make changes in the environment that are in line with his or her goals and values (Deci & Ryan, 2000; Patrick et al., 2007). Relatedness concerns feelings of connection and belongingness with others (Baumeister & Leary, 1995; Deci & Ryan, 2000). Ryan and Deci (2002) defined competence as a person's perception of his or her abilities rather than the actual ability levels. When individuals feel competent in an area, they are more likely to take risks and seek opportunities to develop their skills.

When these three needs are met, students will either be motivated toward their learning tasks because of the inherent worth to the individual (intrinsic motivation), in which case the individual is likely to have interest in this learning task, or because they perceive the learning task as valuable to their sense of self and their future goal or goals (internalization) (Ryan & Deci, 2002). Research has shown that students internalize external values and goals, and are influenced by important contextual factors that can enhance autonomy. Examples of this include teachers' autonomy support and involvement by giving choice to students (Skinner & Belmont, 1993; Skinner, Wellborn, & Connell, 1990). Students' autonomy impacts their learning behaviors and attitudes (Koestner & Loiser, 2002; Lepper, Corpus, & Iyengar, 2005). Research also supports relatedness as being important in students' learning (Goodenow, 1993; Juvonen, 2007). For instance, Skinner and Belmont (1993) found that students' perceptions of instructors' involvement encourage students to commit more fully in a class. Furthermore, Schunk and Pajares (2002) reinforced SDT arguing that students' involvement and participation in school is contingent upon their perceptions of autonomy and relatedness.

In sum, according to SDT, when students have a feeling of connection and belongingness with other students as well as their instructors, a feeling of efficacy in their academic area, and the social context is autonomy supportive, they have intrinsic motivation rather than extrinsic motivation. This idea of facilitating intrinsic motivation for students' academic work is based on the notion that learning can be interesting, enjoyable, even fun. Intrinsic motivation is thought of as a natural process that arises out of students' basic psychological needs (Deci & Ryan, 1985) that allows students to generate their own intentions (e.g., "I want to complete my assignment, it's interesting!"). Intrinsically motivated students learn what it means to seek out, master, and derive pleasure from optimal challenges. As a result, intrinsic motivation helps students improve their academic achievement (Reeve, Ryan, Deci, & Jang, 2007). Furthermore, Vansteenkiste, Zhou, Lens, and Soenens (2005) hypothesized and supported that when people are intrinsically motivated, they tend to adopt more self-regulated learning strategies whereas when individuals are extrinsically motivated, their use of self-regulated learning strategies is negatively affected.

Motivation Constructs

As I mentioned above, numerous motivational theories and constructs have been identified and empirically validated. In addition, many recent studies addressing academic motivation have employed an a priori theoretical approach to the identification of students' motivational constructs and how these regulate students' achievement-related functioning and outcomes (see, e.g., Brophy, 2010; Schunk, Pintrich, & Meece, 2008). However, this single construct approach to explaining students' motivation may

constrain researchers from studying other important motivational constructs and their interactions with external, environment factors, and fail to clarify the relationships of these constructs, both among the constructs themselves and between the constructs and their cognitive, behavioral, and affective concomitants (Pintrich, 2000, 2003; Pietsch, Walker, and Chapman, 2003). Therefore, these have been extensively discussed in recent reviews such as the "Big Theories" (McInerney & Van Etten, 2004). Pintrich (2003) noted: "In general, it will probably be more useful for future motivational science researchers to examine how different constructs from different theoretical models relate to one another, rather than attempting to discover new constructs or create new theories. This type of synthetic and integrative research would not only shed light on the motivational dynamics and potential mediating and moderating roles of different constructs, it could help lead to some clarity and parsimony in the field as it becomes clear how different constructs serve similar functions." (p. 677). Snow (1993) mentioned that "Human beings are not lists of independent variables; they are coordinated wholes" (p. 10). My argument in this study is that statistical methods such as factor analysis are available that allow researchers to examine motivation as coordinated wholes.

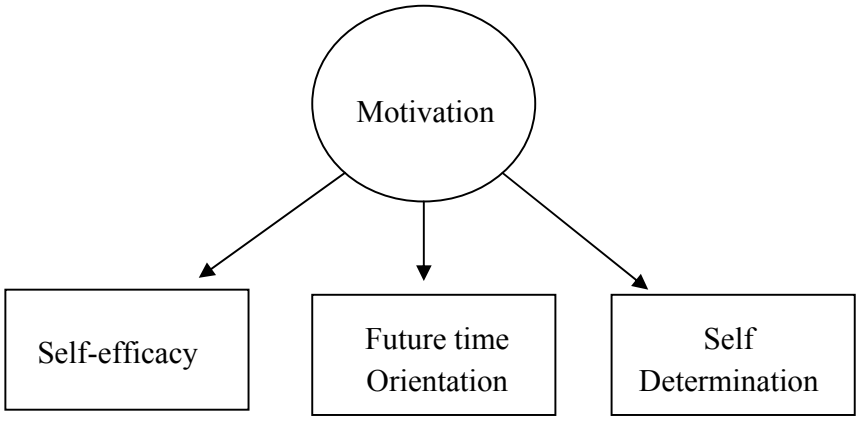

Figure 4 Integrated motivational construct

The relationship among motivation, learning strategies use, and academic achievement

The above research indicates that students' motivation and use of learning strategies are significant predictors of their success. However, learning and achievement are complex processes, and it is important to investigate the ways in which the motivational and learning theories above interact to produce student learning. Recently, several researchers (Matos, Lens, & Vansteenkiste, 2009; Heckhausen & Dweck, 1998) have suggested that the use of cognitive strategies and self-regulation strategies are motivationally driven processes. This means that whether and how students use learning strategies are dependent on their motivational resources. Indeed, whereas some students seem to use learning strategies spontaneously to improve their learning and academic performance, others need to focus intentionally on the use of these strategies, and still others fail to apply learning strategies at all. Differences among

students are to a certain extent a function of learners' motivational resources. Students' motivational goals and other motivational variables can affect their use of learning strategies (Hagen & Weinstein, 1995; Meece, 1994). For example, students who adopt performance goals use more strategies that are superficial (like rehearsal strategies), whereas students who adopt mastery goals use higher levels of learning strategies and self-regulation strategies, and this differential use of learning strategies leads to different learning outcomes. Students can learn to improve their strategic learning and hence to enhance their academic achievement by increasing their intrinsic motivation (Vansteenkiste, Lens, & Deci, 2006; Zimmerman & Marinze-Pons, 1990; Zimmerman & Schunk, 2001).

Cross-cultural Issues

Most learning strategies and motivation theories discussed in this paper were developed in Western culture, particularly the United States and Europe (Heckhausen & Heckhausen, 2008, Schunk & Zimmerman, 1994). Although several models of learning strategies and related theories (e.g., Weinstein's MSL, 2009) have stated that the academic environment is an important factor to explain students' strategic learning, and essential elements of learning and motivation in specific contexts reflect deeply embedded cultural values, cultural influences have, for the most part, not been considered. Generalizations in past research also may not hold across different cultures when exported to other countries. When learning strategy and motivation theories are applied to different countries or new cultural settings to understand students' learning behavior, there may be a mismatch (Boykin, Tyler, & Miller, 2005).

To evaluate the role culture plays in using learning strategies and motivation, it is essential to understand what the construct of culture represents. It is also important to understand the potential impact of culture and cultural differences on leaning, learning strategies, and motivation. Although there are several definitions of culture, for the purposes of this study, *culture* is defined as the values, traditions, and beliefs that mediate the behaviors of a particular social group (Parsons & Bales, 2003). Culture has been related to how individuals approach tasks and activities carried out in home, school, and work contexts. Research on culture has presented several classifications. Culture has often been classified as individual/collectivist, modern/traditional, Western/Asian, and so on. Each of these classifications provides a guide for comparing one group to another. For my cross cultural study, the classifications used was that of Western/Asian.

Several researchers (Purdie & Hattie, 1996, 2010; Lihong, 2010) have already found that a wide range of educational and cultural variations could contribute to differences in student motivation and strategic learning strategies of Western and Asian students. As to the philosophy of both cultures, Western philosophy (Socratic) tends to favor questioning knowledge and expects students to evaluate beliefs and to generate personal hypotheses. Asian philosophy (Confucian) values effortful, respectful, absorptive, and pragmatic learning, and expects learners to absorb defined knowledge (Tweed & Lehman, 2002). With regard to values, Asian cultures (collectivistic) such as Korean, Japanese, and Chinese, tend to put forward the prime values of reciprocity, duty, tradition, dependence, obedience to authority, and balance. In contrast, Western cultures (individualistic) emphasize creativity, challenge, self-reliance, and individual

responsibility as key values (Triandis, McCusker, & Hui, 1990). Therefore, many times Asian students believe that faithfulness and hard work is the most important thing for successful learning. They believe that the best way to learn a subject is through repeated practice and memorization (Salili, Fu, Tong, & Tabatabai, 2001). In addition, most college classes in Asia are highly structured and teacher centered, with students listening carefully and taking notes rather than discussing and participating.

Due to these differences in cultural and educational practice, there can be very significant differences in students' academic behavior, including their use of learning strategies and motivation. Although cross-cultural research on motivation and learning strategies is still not developed enough to explain fully a conceptual framework, there are several empirical studies that show the differences in motivation and use of learning strategies between Western and Asian students. For example, Asian students (and their families) have been found to place a high value on education, emphasize the role of effort in achievement, hold high standards and aspirations, and devote more time to academic work (e.g., Chen & Stevenson, 1989; Dunn and Wallace, 2004; Stevenson, Lee, Chen, Lummis, et al., 1990; Stevenson, Lee, Chen, Stigler, et al., 1990). However, Asian students were also found to have less autonomy in their learning than Western students. Iyengar and Lepper (1999) and Boekaerts (2003) determined that Western children showed more intrinsic motivation when they made their own choices about their learning situations. In contrast, it has been shown that Asian children were most intrinsically motivated when choices were made for them by parents or other trusted, authorized persons. In addition, Kim, Schallert and Kim (2010) found that parents' motivating

styles, both autonomy supportive and controlling, as well as students' perceptions of parents' mastery goal could affect students' motivation and goal orientation. Therefore, when Asian students go to college and there is less motivational pressure from parents and teachers, they are likely to have difficulty maintaining their own intrinsic motivation for learning. Actually, Chirkov, Ryan, Kim, and Kaplan (2003) reported that Asian college students had less internalized motivation and lower self-efficacy when compared to Western college students. Also, there is some research evidence that Asian college students tend to use less self-regulation strategies such as self-monitoring, time-management, self-testing than Western college students (i.e., Purdies & Hatie, 1996; Salili, Fu, Tong, & Tabatabai, 2001; Turingan & Yang, 2009). For example, Purdie and Hattie (1996) investigated whether differences in use of self-regulation strategies and cognitive strategies between Australian and Japanese students. They found that Australian groups report more peer-checking, self-testing, outlining and organizing, goal setting and planning, and seeking teacher assistance. The Japanese students reported more memorizing and reviewing of their textbook. However, some researchers argue that this difference in use of learning strategies and motivation between the two cultures could vary depending on learning contexts and situations (Gorrell, Hwang, & Chung, 1996). In addition, there is not enough evidence to support these cross cultural differences in motivation and learning strategies use. There is a clear need for more research that examines different populations within western cultures as well as cross-cultural research that tests the generalizability of previous research.

Community College

David and Grimes (1999) stated that over the years, community college populations have dramatically increased. The majority of USA students will begin their postsecondary education in community colleges (Chronicle of Higher Education 2001; Fry 2004). Overall, 43% of USA students (58% of Hispanic students and 42% of White students) who decide to continue their education after high school graduation are currently enrolled at 2-year colleges (Snyder et al., 2009). Similarly, in South Korea, almost 40% of post-secondary students are recently enrolled at community college (Yoon, Park, Yoon, & Lee, 2009). Thus, community colleges play a very important role in post secondary education, and there still remain many questions regarding the determinants of college success for populations of students entering community colleges (Robbins, Porchea, Allen, & Phelps, 2010). Several researchers (e.g., Hoachlander et al., 2003; Lai, 2008; Lee & Frank, 1990; Nakajima, 2008; Perin, 2006; Roueche & Roueche, 1993) have reported that the characteristics of community colleges students are different from those enrolled in four-year colleges. Perin (2006) indicated that community colleges offer basic reading, writing, and math in order to assist academically unprepared students, many of whom have come from ethnic and linguistically diverse backgrounds and high schools that are considered educationally less effective. Roueche and Roueche (1993) acknowledged that many students attending community colleges are unprepared. These students are often considered to be at *high risk* for academic failure and are frequently of low socioeconomic status, from culturally disadvantaged backgrounds, and are often first generation college attendees. These characteristics of community college students

affect their academic success. Nearly half (45 percent) of community college students who began college in 2003-2004 had left school without completing a degree or certificate program by 2006 (NCES, 2008). Large numbers of community college students are leaving school without getting the education they need to progress along their career path, start a new career, or transfer to a 4-year college or university (Bailey, Calcagno, Jenkins, Kienzl, Leinbach, 2008).

Although many researchers have reported that community college students are different from four-year college students and many of them cannot achieve their academic goals, there is little data available to denote the attitudes, values, self-expectations, and use of learning strategies for community college students. Even though there have been many research studies conducted to investigate the dynamics among academic performance, study skills, metacognition, motivation, self-efficacy, and self-regulation in the general college population, there still remain many questions regarding the determinants of college success, especially for the academically high-risk populations entering community colleges (Robbins et al., 2010). If researchers investigate these areas and build more knowledge about community colleges and their student populations, perhaps we can help these students to become more effective learners and achieve their educational goals (Perez & McDonough, 2008). My study was aimed at providing some answers to these questions.

Chapter 3

Methodology

Research Overview

This chapter presents a description of the research design, research participants, and the research instruments. My major goal for this research is to test out a conceptual model based on theoretical frameworks of student demographics, cognition, self-regulation, and motivation variables affecting student academic performance and evaluate the extent to which these relationships hold between American students and Korean students in community colleges. As a first step, I explored the relationship among the demographic, cognitive, self-regulation, and motivation variables, and academic achievement, and also those variables' interactions with one another to influence student academic achievement. Several researchers have already found relationships among these variables individually. However, I tested my proposed conceptual model to show the usefulness of the Model of Strategic Learning (Weinstein, 2006) with two community college student groups. Second, I examined cross-cultural differences in those variables affecting student academic achievement between American and Korean community college students. As I discussed in the previous chapter, there are a number of studies that found cultural differences on variables that may impact student's academic achievement (Chen & Stevenson, 1989; Dunn & Wallace, 2004; Lihong, 2010; Purdie & Hattie, 1996, 2010; Stevenson et al., 1990; Stevenson et al., 1990).

Research Questions and Hypotheses

The proposed initial model shown in Figure 5 is a simple way to depict the research questions and hypotheses for this dissertation study. Presented below Figure 5 are the research questions, hypotheses, and rationales for each hypothesis. These are followed by an overview of the subjects, procedures and instruments that were used.

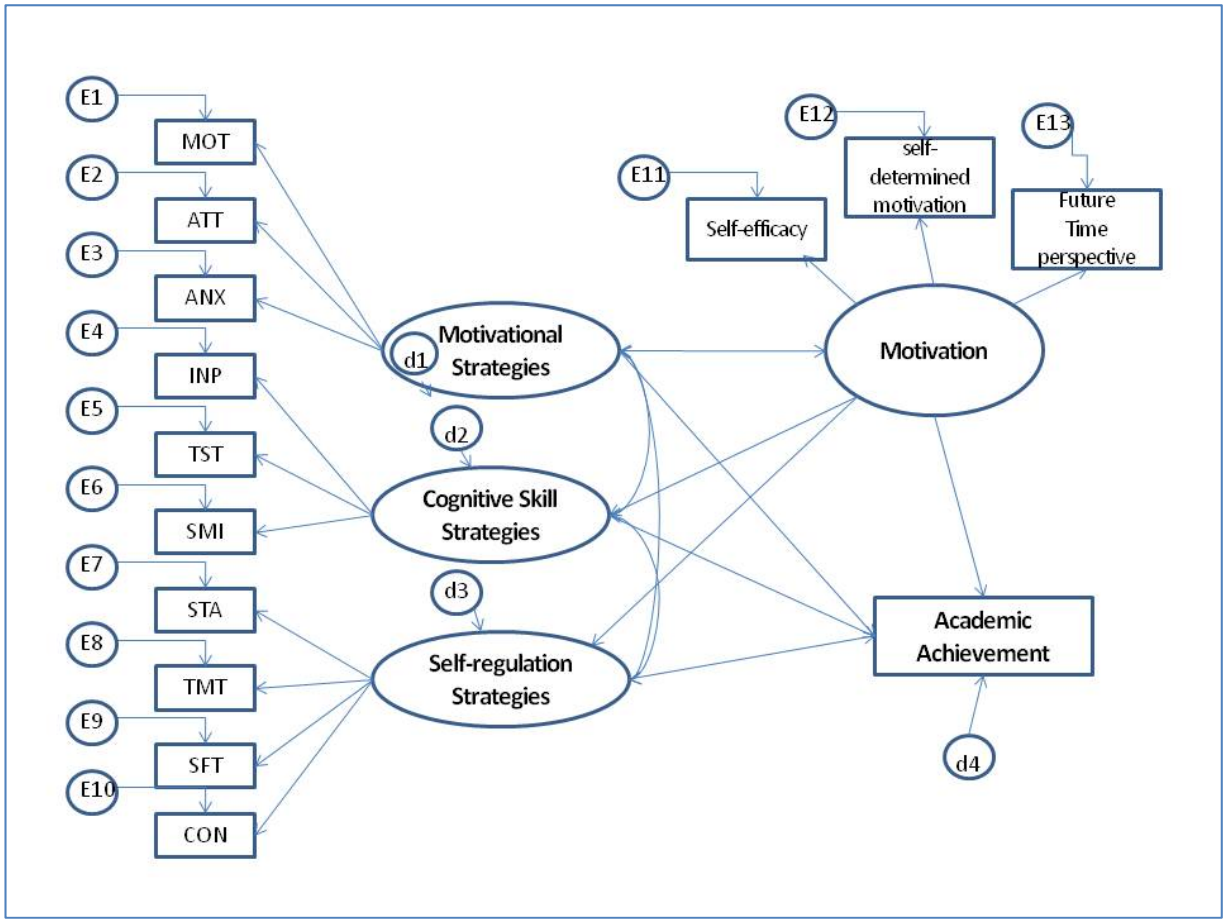

Figure 5 Initial model of the influence of student's motivational variables and use of learning strategies on student's academic achievement

Research Question 1

What are the relationships among cognitive/motivational/self-regulative strategies and academic achievement in community colleges?

Hypothesis 1(a): Students' reported **motivational variable scores** are positively related to students' reported **use of motivational strategies** in the overall model.

Hypothesis 1(b): Students' reported **motivational variable scores** positively influence on students' reported **use of self-regulation strategies** in the overall model.

Hypothesis 1(c): Students' reported **motivational variable scores** are positively related to students' reported **use of cognitive learning strategies** in the overall model.

Hypothesis 1(d): Students' reported **motivational variable scores** positively predict student's **academic achievement** in the overall model.

Hypothesis 1(e): Student's reported **use of cognitive strategies** positively predicts students' **academic achievement** in the overall model.

Hypothesis 1(f): Students' reported **use of self-regulation strategies** positively predicts **student's academic achievement** in the overall model.

Hypothesis 1(g): Students' reported **use of motivation strategies** positively predicts student's **academic achievement** in the overall model.

Rationale

Previous research on these learning processes has revealed that, in comparison to poor learners, good learners set better learning goals, manage their motivation, implement more effective learning strategies, monitor and manage their goal progress better, and seek assistance more often when it is need (e.g., Graham, Harris, & Troia,

1998; Nota et al., 2004; Pajares, 2009; Schunk, 2008; Singleton-Williams, 2010; Vrugt & Oort; 2008). For instance, Vrugt and Oort (2008) found that the use of self-regulative and cognitive strategies had significant effects on exam scores for college students. Singleton-Williams (2010) examined the positive relationship between motivational learning strategies and academic success of community college students. Therefore, I hypothesized that motivation, motivational strategies, self-regulation strategies and cognitive strategies are positively related to academic achievement of community college students. In my literature review, I also found some research evidence to show the relationship between motivation variables and student's use of motivational strategies, self-regulation strategies and cognitive skill strategies. There are several studies that found motivated students use more cognitive learning strategies and self-regulation strategies (Bouffard-Bouchard et al., 1991; Schunk, 1981; Zimmerman & Kitsantas, 1999; Zimmerman & Martinez-Pons, 1990). More specifically, Bouffard-Bouchard et al. (1991) found that students can be taught self-regulation strategies as a learning process, but their use of these self-regulation strategies can or cannot be sustained depending on students' motivation. In addition, Zimmerman and Martinez-Pons (1990) and Schunk (1981) found that student's high self-efficacy could lead to increases in students' using self-regulation strategies and academic learning skills. In sum, I hypothesize that several motivational variables influence students' use of learning strategies including self-regulation strategies, cognitive strategies and motivational strategies.

Research Question 2

Does the proposed model (see Figure 5 on Page 46) vary between American and Korean community college student groups?

Hypothesis 2(a): All factor loadings are invariant between American and Korean community college students (the data display metric invariance between two groups).

Hypothesis 2(b): All factor means are different across American and Korean community college students groups.

Hypothesis 2(c): There are differences in the relationships between latent variables in the model for American community college students and latent variables in the model for Korean community college students.

Rationale

The issue of cultural difference in students' strategic learning and motivation, and the relationship among cognitive/motivational/self-regulative strategies and academic achievement has received relatively little research to date. However, there are a few studies indicating that cultural group differences are an important factor for the use of learning strategies and motivation. Purdie & Hattie (1996) also found that a wide range of educational and cultural differences could contribute to differences in student motivation and strategic learning strategies of Western and Asian students. It is relatively difficult to set hypotheses about which relationships among cognitive/motivational/self-regulative strategies and academic achievement will be different between Korean and American community college on using the proposed model because of the lack of previous evidence. Thus, I can expect that generally their

relationship might be different between the two groups in the model.

As a first step of data-analysis to test my initial model, I conducted two single-group confirmatory factor analyses of 13 items with 4 factors. Results from these analyses yielded poor model fit for both the American ($\chi^2(98) = 1304.90$, $p < .001$, CFI =0.70, SRMR = 0.16, RMSEA = 0.13) and the Korean students ($\chi^2(98) = 1152.37$, $p < .001$, CFI =0.77, SRMR = 0.13, RMSEA = 0.10). Consequently, I could not move forward to other steps and it was necessary to modify the initial model for better model fit. The rationales for modifying the initial models by revising some of the subscales are addressed below.

First, I decided to combine motivational strategies and motivation variables due to an extremely high correlation between these two factors for both American (r=0.85, $p < .001$) and Korean students (r=1.00, $p < .001$). According to Kline (2005), if a correlation between constructs exceeds .85, this indicates lack of discriminant validity. Although students' use of motivational strategies and motivational variables (such as student self-efficacy or future time orientation) can be distinguished conceptually, each of the items in this instrument to measure the concept is very similar. Thus, I thought that it would be better to combine them into one construct instead of two separate factors.

Second, in motivational strategy subscales, anxiety has a relatively low loading on use of motivational strategies (see Table 3-1). In addition, some researchers (Grooms & Endler, 1960; Tooth & McManus, 1989) have pointed out that anxiety was not significantly related to other motivational variables and academic achievement in a

linear fashion. Therefore, I decided to exclude the anxiety subscale in the motivation construct as well as in my final proposed model.

Third, the self-determination subscale did not load well on the motivation construct in both American and Korean groups (see Table 1). Following Steven's (1996) guideline, the items with factor loadings lower than .40 should be removed. Therefore, I decided to eliminate this subscale in my final model to test.

Fourth, when I conducted reliability testing, most of the subscales were demonstrated to be reliable as well as homogeneous in both versions. Nine of thirteen subscales from the American survey had alpha coefficients above .8, and four scales had alpha coefficients above .70. However, seven of thirteen had coefficient alpha above .8, and five had coefficient alpha above .70 in the Korean version. Although most of the Korean scales were still acceptable, Study Aids (α=.54) needed to be rechecked and modified. Therefore, I decided not to include Study Aids in the self-regulation strategies as well as in my final model.

Table 1 Unstandardized loadings (standard errors) and standardized loadings for motivation strategies and motivation factors

Factor loadings	American		Korean	
	Unstandardized (SE)	Standardized	Unstandardized (SE)	Standardized
Motivational strategies				
Anxiety	0.238 (0.043)	0.270	0.025 (0.032)	0.034
Motivation	0.380 (0.022)	0.704	0.418 (0.026)	0.639
Attitude	0.535 (0.026)	0.828	0.424 (0.022)	0.736
Motivation				
Self-efficacy	0.420 (0.033)	0.657	0.534 (0.027)	0.773
FTO	0.383 (0.031)	0.630	0.319 (0.019)	0.662
Self-determination	0.200 (0.048)	0.230	0.159 (0.023)	0.300

As a result, the modified model shown in Figure 6 (page 49) is an alternative way to depict the research questions and hypotheses for this dissertation study. Presented below Figure 6 are the modified hypotheses.

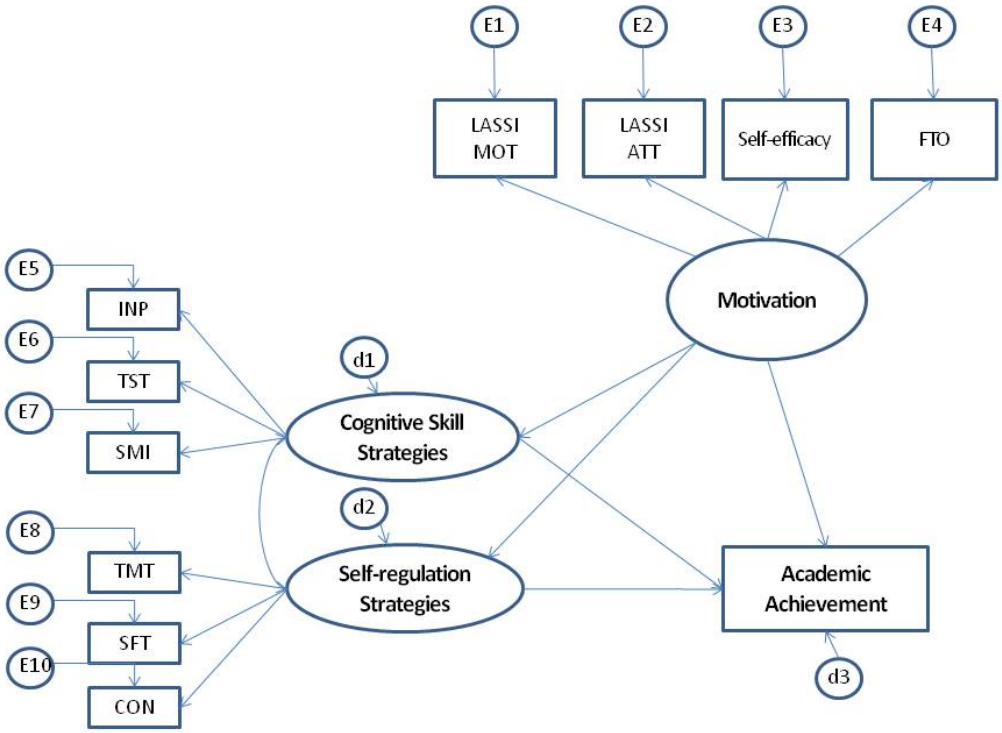

Figure 6 Modified model of the influence of student's motivational variables and use of learning strategies on student's academic achievement.

Modified Research Question 1

What are the relationships among cognitive/self-regulative strategies, motivation and academic achievement in community colleges?

Modified Hypothesis 1(a): Students' reported **motivational variable scores** have a positive influence on students' reported **use of self-regulation strategies** in the overall model.

Modified Hypothesis 1(b): Students' reported **motivational variable scores** have a positive influence on students' reported **use of cognitive strategies** in the overall model.

Modified Hypothesis 1(c): Students' reported **motivational variable scores** positively predict student's **academic achievement** in the overall model.

Modified Hypothesis 1(d): Students' reported **use of self-regulat ion strategies** is positively related to students' reported use of **cognitive strategies** in the overall model.

Modified Hypothesis 1(e): Student's reported **use of cognitive learning strategies** positively predicts students' **academic achievement** in the overall model.

Modified Hypothesis 1(f): Students' reported use of **self-regulation strategies** positively predicts **student's academic achievement** in the overall model.

Modified Research Question 2

Does the proposed model (see Figure 6 on Page 47) vary between American and Korean community college student groups?

Hypothesis 2(a): All factor loadings are invariant between American and Korean community college students (the data display metric invariance between two groups).

Hypothesis 2(b): All factor means are different across American and Korean community college students group (Group differences on the factor means). More specifically, American community college students obtain higher scores on Motivation, use of cognitive strategies, and use of self-regulation than Korean students.

Hypothesis 2(c): There are differences in the relationships between latent variables in the model for American community college students as com

pared to Korean community college students (the data display partial invariance between the two groups in the structure model).

Research Design

A non-experimental convenience sample survey design was utilized. While cross-sectional survey design is generally used to study associations that occur naturally between predictor and criterion variables, efforts have been made to increase the likelihood that the data collected represent the overall community college student population as best as possible given the convenient nature of the sample.

Instruments (Measurement)

Demographic Information Survey: age, sex, parents' highest level of education (first generation status was derived from this), family income (SES was derived from this), and hours worked weekly.

Learning Strategies: **The Learning and Study Strategies Inventory (LASSI), 2nd Edition** is a 10-scale, 80-item assessment of student awareness about, and use of, learning and study strategies related to skill, will, and self-regulation components of strategic learning (Weinstein & Palmer, 2002). The LASSI has 10 subscales: Anxiety, Attitude, Concentration, Information Processing, Motivation, Selecting Main Ideas, Self-Testing, Study Aids, Test Taking, and Time Management. This measure is based on Weinstein's Model of Strategic Learning where three critical components for successful learning are defined: skill, will, and self-regulation. LASSI items are measured on a 5-point Likert scale: 1 (not at all typical of me), 2 (not very typical of me), 3 (somewhat typical of me), 4 (fairly typical of me), 5 (very much typical of me). Using this inventory, research has repeatedly demonstrated that these factors contribute significantly

to success in college (Proctor, Prevatt, Adams, Hurst, & Petscher, 2006; Yip & Chung, 2005).

Sample items for the LASSI scale

"I put off studying more than I should"

"I try to relate what I am studying to my own experiences"

Self-Efficacy: **The Self-Efficacy for College Success Scale (SCS)** was created to measure student confidence in their future college success by the Community College Longitudinal Retention Study research team (CCLR Team). The four items assess student confidence about performing well in their courses, finishing their program, and reaching their educational goals. The scale is comprised of 4 items and there are no subscales. Students responded to each item using a five-point Likert-type scale: 1 (not at all likely), 2 (not very likely), 3 (somewhat likely), 4 (likely) and 5 (extremely likely).

Sample items for the Self-Efficacy for College Success Scale

"I will do well in my community college courses"

"I will finish my community college program, certificate, or degree."

The Future Time Perspective: **The Future Time Perspective** measure was developed by the CCLR research team based on the work of Husman & Gorin (1998), Lens (1986), and others. It is a 15-item measure of the degree to which a student integrates the future into their goal-setting processes. Future time orientation can be defined as a degree to which and the way in which the chronological future is integrated into the present life-space of an individual through motivational goal-setting processes (Husman & Lens, 1999). In terms of academic settings, future time orientation can also

be defined as student's feelings or beliefs about the relationship between the information that will be presented in students' courses and their future goals (Bembenutty & Karabenick, 2004). There have been several studies investigating the relationship between future time orientation and academic achievement as well as academic motivation (Brown & Jones, 2004, Husman & Lens, 1999). Furthermore, some researchers have proposed that future time orientation can be incorporated with self-regulation of learning (Bembenutty & Karabenick, 2004, Miller et al., 1996). Thus, future time orientation gives us a more complete picture of student academic motivation and that it is important to investigate the relationships between future time orientation and other learning variables. This scale has no subscales. Students responded to each item using a five-point Likert-type scale: 1 (not at all likely), 2 (not very likely), 3 (somewhat likely), 4 (likely) and 5 (extremely likely).

Sample items for the Future Time Orientation Scale

"I think about how what I am doing today relates to my future goals."

"Because I am too busy taking care of the present, I do not think much about the future."

Help-seeking: Another metacognitive strategy that can be very helpful for learning is help-seeking. Good self-regulators know when, why, and from who to seek help (Newman, 1998). Help-seeking is a social strategy, because it involves a learner's procurement of help from others in the environment (Ryan & Pintrich, 1997). The Academic Help-Seeking measure (AHS) was developed by the CCLR Research Group based on the work of Karabenick & Knapp (1991), Pajares, Cheong, & Oberman (2004),

and Ryan, Pintrch, & Midgley (2001). It is a 12-item measure examining the type or degree to which students do or do not seek academic help when they need it. The AHS has three subscales: Avoidance of Help Seeking, which assesses a student's tendency to avoid seeking help when it is needed; Executive Help Seeking, which assesses a student's tendency to want someone to simply tell them how to do an academic task; and, Instrumental Help Seeking, which assesses a student's tendency to seek only enough help to enable him to complete a task on his or her own. Students responded to each item using a five-point Likert-type scale: 1 (not at all typical of me), 2 (not very typical of me), 3 (somewhat typical of me), 4 (fairly typical of me), 5 (very much typical of me).

Sample items for the Help-seeking scale

Avoidance of Help Seeking Item Example: "Even if I do not understand what is being taught in a class, I do not ask for help."

*Executive Help Seeking Item Example: "*When I ask the instructor for help on something I do not understand, I want the instructor to give me the answer rather than explain it to me."

*Instrumental Help Seeking Item Example: "*If I need help in a class, I only want as much help as necessary to complete the work myself."

Research on academic help seeking has shown that help-seeking behaviors or tendencies play a moderating role in academic achievement (Karabenick, 2003; Newman, 1998; Ryan & Pintrich, 1997; Wigfield & Eccles, 2002). In other words, students' ability or willingness to seek help in an academic setting is directly related to their academic performance. This is particularly relevant to the community college setting

because a large proportion of community college students lack the ability to succeed independently in the developmental (prerequisite, non college credit-bearing) courses in which they are often enrolled. If the students do not have basic skills and do not seek help, the likelihood of their passing college courses can be very low. Students who are placed in developmental math courses, especially, may not be able to progress towards their degrees since math often serves as a gatekeeper to many advanced college level courses. Therefore, help seeking is of utmost importance in closing the gap in mathematics achievement among community college students and ensuring that these students in fact receive a higher education (Lai, 2008).

Intrinsic and extrinsic motivation: The Self-Regulation Questionnaire - Academic (ASRQ: Ryan and Connell, 1989) assesses self-determined motivation among college students based on the definition developed in the Self-Determination Theory (Deci & Ryan, 2000). The ASRQ has four subscales: Intrinsic, Integrated, Identified, and External, which represent the degree to which an individual has internalized his or her beliefs and behavior. These four forms of regulation are based on a sub-theory of the Self-Determination Theory. For the purposes of this research, I made changes to the Academic Self-Regulation Questionnaire. Because the questionnaire was originally developed for elementary and middle school students, I chose to change some of the wording to be more appropriate for community college students.

For example, the target, "teacher" was changed to "instructor." Also, the original ASRQ has four different stem questions for which students give responses, however, only three of these stems were appropriate for the population for the current

study. Thus, the stem, "Why do I try to answer hard questions in class?" was removed. Furthermore, all items were changed to future tense, because students rate these items based on their expectations for their behavior in the upcoming semester.

ASRQ items are measured on a 5-point Likert scale: 1 (not at all true), 2 (a little true), 3 (somewhat true), 4 (fairly true) and 5 (very true).

Sample items for The Self-Regulation Questionnaire

A. Why will I do my assignment?

"Because I will want the instructor to think I am a good student"

"Because it will be fun to do them"

Procedure

(1) The Community College Longitudinal Retention Study in the United States

I am the Associate Principal Investigator of the Community College Longitudinal Retention Study Research Team (CCLR team) directed by Claire Ellen Weinstein and Taylor Acee. Originally, Dr. Weinstein partnered with San Antonio College (a community college) in San Antonio, Texas for this research project in 2007. In addition, they were part of an Achieving the Dream grant from the Lumina Foundation (awarded to the Alamo Community College District) and have been collecting extensive data about their school and students. When conducting a longitudinal study, it takes a team of researchers, practitioners and administrators working together to get a valid and relatively complete sample. The President of SAC, Dr. Robert Ziegler, is both enthusiastic and supportive of our project, as are numerous members of the college academic and student

affairs divisions. This full study is a longitudinal study and will follow the entering class of fall 2007 at San Antonio College (SAC) for a period of approximately 6-7 years.

Survey Administration

The survey was administered to Fall 2007 entering students during the first week of the semester over the course of two 45-minute class sessions of an orientation course required of all entering students. The original research sample included approximately 2700 students. However, due to management and recording system changes, we currently only have valid GPA and retention data on 1,283 students. In addition, there are two survey forms (Form A and Form B) in this research and only Form A included college the LASSI version (Form B included the high school (LASSI – HS) versions). Because I used the college LASSI version in the community college research at Korea, the final American sample for my dissertation research included approximately 550 students. First, students answered six demographic questions: age, sex, ethnicity, parents' highest level of education, family income and hours worked weekly. Next, students completed the main questionnaire that included the Learning and Study Strategies Inventory, 2nd Edition (LASSI) for college students and the Self-Efficacy for College Success measure. Then students completed the Future Time Orientation (FTO) measure, the Academic Help Seeking (AHS) scale, and the Self-Regulation Questionnaire- Academic (ASRQ).

The course instructors administered the survey. Instructors were provided with written instructions in addition to the instructions included on the survey itself. Prior to students beginning the survey, instructors were directed to emphasize that students

should answer honestly about what they do and what they think, and that the results of this survey would in no way affect their course grade or their future academic endeavors at SAC.

(2) Community College Research in Korea

Step 1: Developing Korean Instruments

In order to compare variables affecting community college student learning in the United States and Korea, I developed instruments that could be used with students in a Korean community college. In the early developmental stage, I studied the Korean educational system and reviewed relevant literature on Korean student learning strategies and study skills, academic motivation, and self-regulation strategies. The information from this initial research helped me to identify unique aspects of Korean culture and educational practices, as well as common aspects between Korean and American cultural and educational practices. Based on this foundational work, an initial item pool was developed by translating original items from the: LASSI, Self-Efficacy for College Success Scale (SCS), Future Time Orientation measure (FTO), Academic Help Seeking (AHS), and the Self-Regulation Questionnaire-Academic (ASRQ) into Korean. In order to account for differences in language structure and use, culture, and educational practices across the two countries, a group of five Korean undergraduate students who were enrolled as ESL students at a major university were asked to provide feedback about each item in the pool, and then these items were revised accordingly. Students explained what they thought the item was asking; if it makes sense in Korean, given the English meaning; if it fits with their school experiences in Korea (educational practices)

and how it might be improved. Next, back translations were performed by outside experts to ensure semantic equivalence between the Korean and the American versions. Some items were further modified after considering Korean cultural and educational practices, and some items were created to more closely represent the unique characteristics of Korean culture and educational practices. These iterative processes of item generation and modification were conducted four times followed by a final review and modification by expert English and Korean specialists in learning strategies, motivation, self-regulation and assessment. This overall process helped me to develop new measures which are designed to be culturally and educationally relevant for Korean college students while still remaining aligned with the American versions.

Step 2: Korean Survey Administration

The Korean Community College Survey was administered in the spring 2010 to the entering class during the beginning of the semester (the Korean school year begins in the spring not fall). Participants in this study were students across 30 departments at Myong-ji College in Seoul, South Korea. The final sample consisted of 616 students in Myong-ji College after eliminating incomplete surveys (less than 5%). The Korean college student survey was administrated to students during the beginning of the semester (before mid-term exams) across various department courses. The course instructors and teaching assistants (TAs) administered the survey. Instructors and TAs were provided with written instructions in addition to the instructions included on the survey itself. Just like the procedure with the American Community College Survey, prior to students beginning the Korean Community College Survey, instructors were directed to

emphasize that students should answer honestly about what they do and what they think, and that the results of this survey would in no way affect their course grade or their future academic endeavors at Myong-ji College.

Statistical Analysis

The primary purpose of this dissertation study was to examine the structural relationships among cognitive, self-regulation, and motivational variables affecting student achievement. A secondary purpose was to evaluate the extent to which these relationships hold across different cultural groups. Structural Equation Modeling (SEM) analysis using M*plus* were conducted in order to answer the research questions because of its ability to estimate the influences of measurement errors when estimating parameters (Hair, Anderson, Tatham, & Black, 1998; Kline, 2005; Raykov & Marcoulides, 2000; Thompson, 2000; Ullman, 1996).

Structural Equation Modeling (SEM) is a general and useful multivariate analysis technique that combines the logic of factor analysis (measurement model) and path analysis or multiple regressions (structural model). The SEM technique has several advantages as follows: First, SEM allows reducing measurement error by having multiple indicators of a latent variable. Second, SEM helps to test overall models and individual parameters simultaneously. Third, SEM has an ability to statistically compare competing theoretical models (Keith, 2006). Fourth, SEM is able to model relations across groups or across time. In addition, Jöreskog (1993) expressed that the SEM technique can be used for three methodological approaches; (1) strictly confirmatory, (2) alternative models, and (3) model development.

My purpose in this study was to test a model among learning strategies, motivation, and academic achievement based on a theoretical framework, in order to explore alternative models which are theoretically grounded, and test whether these models are moderated for American and Korean Community college student groups. Therefore, these SEM techniques should be useful to address my research questions.

There are six basic procedures of SEM suggested by Kline (2006). The first step is that the researcher should hypothesize a model to be expressed in the form of a structural equation model. The second step is that the researcher needs to determine whether the model is identified. For example, if a model cannot meet certain identification requirements (the number of unique pieces of information in the covariance matrix should be greater than the number of parameters requiring estimation that is over identified), the model cannot be estimated. The third step is selecting and preparing measures of the variables represented in the module, as well as collecting and screening data. The fourth step is that the researcher needs to estimate the model. The researcher needs to evaluate model fits for both the measurement model and the structural model including indices, such as Comparative Fit Index (CFI; Bentler, 1990), Tucker-Lewis index (TLI; Tucker & Lewis, 1973) and Root Mean Square Error of Approximation (RMSEA). If the initial model does not fit the data, the researcher needs to go to step 5 which involves revising the model. The fifth step is re-specifying the model and evaluating the fit of the revised model to the same data if necessary. Once appropriate fit is obtained, it is essential that the researcher be able to interpret the findings according to relevant research and describe the final model.

Multi Group SEM (MG-SEM)

The main questions of the current study are:

1) Do model parameters vary between American and Korean community college student groups in the measurement model? Stated differently, does the measurement model (including indicator loadings, indicator intercepts [indicator means], and errors differ between the American and Korean groups?

2) Do factor means, such as motivation, students' use of self-regulation strategies, and students' use of cognitive strategies, vary between American and Korean students?

3) Do values of model parameters vary between American and Korean community college student groups in the structure model? In other words, does group membership moderate the relations specified in the model?

In order to answer these questions, I used the Multi Group SEM (MG-SEM; also known as Multi-Sample SEM). This MG-SEM technique allows for testing differences in the latent means between groups, as well as for examining whether the same model (measurement and structure) is invariant across groups (Thompson & Green, 2006).

Multi-Group SEM (MG-SEM) can be estimated using M*plus*. When a particular theoretical model is justified as a good enough approximation for the sample data of a homogenous group, the research question can be addressed as to whether the same model holds across heterogeneous groups (here, United States and Korean Community College students). For this, different levels of measurement invariance can be tested (Byrne, Shavelson, & Muthén, 1989; Cheung & Rensvold, 2002; Vandenberg & Lance, 2000). Before testing potential differences in structure parameters, support for measurement

invariance must be found. The most stringent model that can be tested involves a test of the equality of covariance matrices between two groups (i.e., omnibus invariance). If this assumption is met, no more tests are necessary. For this case, it can be concluded that there is no difference at all among any variables and relationships among variables between the two groups. However, it is very rare to examine this equivalence of covariance matrices among groups. Thus, many researchers recommend not using omnibus invariance as the beginning step of a test for invariance (Byrne et al., 1989; Bontempo, Hofer, & Lawrence, 2007). If the equivalence of covariance matrices between two groups is not assumed, then the source(s) of the non-invariance needs to be identified by stepwise adding three increasingly restrictive levels of factorial invariance (e.g., Meredith, 1993). Several researchers (Meredith, 1993) suggest that strong invariance (scalar invariance), that is equivalent on factor loadings and intercepts across groups, is acceptable to compare factor means and to conduct MG-SEM to test structure models. However, some researchers (Byrne et al, 1989) argue that full scalar invariance is not a necessary prerequisite for conducting further tests as long as there are only a few intercept variables that do not have the same intercepts or same factor loading across groups (partial invariance or partial scalar invariance).

In order to do MG-SEM, these steps should be followed:

(1) Confirmatory Factor Analysis (CFA) in each single group ,

(2) Multi-Group Confirmatory Factor Analysis (MG-CFA), and

(3) Multi-Group Structural Equations Modeling (MG-SEM for Structure model)

(1) Confirmatory Factor Analysis in each single group

The Structural Equation Modeling (SEM) technique that is available through M*plus* was used to perform CFA on separate groups (American and Korean community college students groups) to examine model fit in each group. Hoe & Brekke (2009, p. 97) said "Testing measurement invariance would not proceed if a single-group confirmatory factor analysis did not fit into the data because the lack of fit would indicate that even configural invariance would not hold across groups". Therefore, it is necessary to conduct CFA before MG-SEM. If a model shows acceptable fit indices in both groups, then multiple-group CFA (MG-CFA) can be conducted to test the measurement invariance across groups.

(2) Multi-Group Confirmatory Factor Analysis (MG-CFA)

Multi-Group Confirmatory Factor Analysis (MG-CFA) is a popular method for the examination of measurement invariance and specifically, factor invariance. Recent research has begun to focus on using MG-CFA to detect invariance for test items (French & Finch, 2008). As a first step of MG-SEM, a CFA measurement model without a mean structure was evaluated. The main purpose of this step is to investigate whether a set of indicators assesses the same constructs between two groups.

The first step is to create a baseline model which fits for both American and Korean community college student groups. This freely estimated CFA model assuming configural invariance, in which none of the factor loadings, intercepts, and errors variance and covariance are constrained, should fit, although this model should include the same number of factors and the same pattern of loadings between the two groups

(Horn & McArdle, 1992). Second, if the baseline model adequately fits the data, then metric invariance between the two groups is tested by constraining the factor loading of the same indicators to be equal across groups (weak factorial invariance or metric invariance: Meredith, 1993). However, the indicator intercepts and error variances and covariances are freely estimated in the American and Korean community college student sample. Third, once metric or partial metric invariance is established, scalar invariance (strong invariance) is assessed. Scalar invariance determines if the means (intercepts) of the indicator variables are equivalent between the groups. To assess for scalar invariance, constraints are placed upon the intercepts (i.e., means for the indicators). Importantly, all constraints placed upon the model to establish metric invariance remain in the model when assessing for scalar invariance (Thompson & Green, 2006), and all error variances and covariances are allowed to freely vary between the groups.

If the assumption of scalar invariance is not met (if fit indices indicate poor model fit), a search is conducted to determine which intercepts should be allowed to freely vary between groups. Then, these constraints of some intercepts could be relaxed. Subsequent analyses, such as comparing factor means between groups or conducting MG-SEM can be done, then proceeding under conditions of partial scalar invariance or partial invariance (Byrne et al., 1989). Although several researchers (e.g., Meredith, 1993) suggested that establishment of scalar invariance (strong invariance) is essential if comparisons between factor mean scores are to be conducted, other researchers (e.g., Byrne et al, 1989) argued that full scalar invariance is not a necessary prerequisite for conducting further tests, such as a factor invariance and structure modeling, as long as

there are only a few intercept variables that do not have the same intercepts across groups (i.e., partial scalar invariance).

Fourth, if the conditions of configural, metric, and scalar invariance (or partial invariance) are met, differences in the factor means between groups (here, students' motivation, use of cognitive strategies, and use of self-regulation strategies) can be assessed. This testing provides information regarding cross-culture differences concerning how American community college students differ from Korean students in their motivation, use of cognitive strategies, and self-regulation. The estimation of the differences in the factor means is accomplished by allowing the factor means to be freely estimated in the Korean group while being fixed to zero in the American group (here, reference group).

(3) Multi-Group Structural Equations Modeling (MG-SEM)

Once an invariant (or partially invariant) confirmatory measurement model is estimated, MG-SEM is followed to test the proposed relationships among the constructs across groups. In this step, mean structures are added to the final MG-CFA model and the invariance of structural relations among latent variables is tested. In other words, the structural paths are freely estimated across groups in the unconstrained model (i.e., baseline model). If this unconstrained model adequately fits the data, as a next step, equality constraints are imposed in the path coefficients in order to test the equivalence of structural paths across groups (i.e., full constrained model). After these steps, the baseline and the constrained model are compared using a chi-square difference test and other fit indices, such as CFI, TLI, RMSEA, and SRMR. If the fit of the constrained

structure model is significantly different from the fit of the unconstrained structure model in a χ^2 difference, and also results in a significant decline in fit according to CFI, TLI, RMSEA, and SRMR values, it can be concluded that some or all of the structural paths among factors and variables are not equal in the population from which the samples are drawn. To determine which structural path constraints should be relaxed, equality constraints on the structural paths are freed, one by one, using modification indices, and the relative fit of the model in comparison to the unconstrained model is re-assessed using a χ^2 difference test and comparing other fit indices after each constraint is released. As a result, the invariance between groups for each individual structural path in the model is examined, to determine whether the data empirically supports the hypothesized relationships between factors in the final measurement model.

Assessing Fit

Goodness of fit is the degree to which the observed input matrix (usually called the variance-covariance matrix) is predicted by the estimated model (Kline, 2005). Chi-square (x^2) is the commonly reported measure of fit and has the advantage of allowing a statistical test of the fit of the model (Keith, 2006). The chi-square statistic tests the absolute fit of the model to the data. A non-significant result is necessary for goodness of fit, but because the statistic is dependent on degrees of freedom and sample size, large sample sizes increase the likelihood of obtaining significant results (Bollen & Bollen, 1989; Keith, 2006). This is why other fit indices are commonly used to assess model fit in SEM.

For the purposes of the current study, the following fit statistics were utilized: χ^2, the Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), the Root Mean Square Error of Approximation (RMSEA), and the Standardized Root Mean-Square Residual (SRMR) (Gibbs, Giever, & Higgins, 2003). Generally, CFI and TLI values in the range of .90 to .95 may be indicative of an acceptable model (Bentler, 1990). Browne and Cudeck (1993) suggested that an RMSEA of .05 or less indicates a good fit, and a model whose RMSEA is from .08 to .10 is an adequate fit. On the other hand, a value of .10 or more indicates a poor fit and should be rejected. In addition, Kline (2005) mentioned that a value of SRMR less than .10 is generally considered favorable. On the other hand, Hu & Bentler (1999) recommend joint criteria for assessing model fit, because a single index reflects only a particular aspect of model fit. For example, utilizing both the SRMR at values less than .10 and the CFI at values > .96 may minimize the likelihood of either rejecting a model with good fit or of accepting one with poor fit.

CHAPTER 4

RESULTS

The purpose of the current chapter is to provide the results of the study. First, the demographic characteristics of the sample are presented. Then, the results of single-group CFA are reported. Finally, the results of multiple-group CFA and multiple-group SEM are discussed.

Demographic Characteristics

The demographic characteristics of the 509 American participants and the 615 Korean participants are shown in Table 2. For both the American and the Korean community college samples, a little over half (American = 58.4% and Korean = 58.4%) were of traditional college age (between ages of 17 and 20), while the rest were primarily between the ages of 21 to 35 (American = 40.3% and Korean = 39.2%). Among the respondents, 57% of the American community college students and 58% of the Korean students were females. Of these respondents, the majority of the American (60.9%) and Korean (63.7%) community colleges students were first-generation students. While most demographic characteristics were pretty similar between the American and Korean sample, one notable difference is that the community college students' hours worked per week was significantly different between the two groups (χ^2 (6, N = 1159) = 285.179, p = <.001). The majority of the Korean community college students reported that they were not working, whereas only 16% of the American community college students reported that they were not working.

Table 2 Demographic characteristics of respondents

Demographic variable	American Community college students (N=509)	Korean Community college students (N= 615)
Age	20.57(5.108)	21.32 (4.5)
17-20	58.4%	58.9%
21-25	27.9%	34.4%
26-35	12.4%	4.8%
>35	1.3%	1.9%
Gender		
Male	42.7%	42.0%
Female	57.1%	58.0%
First Generation		
No first generation	39.1%	36.2%
First generation	60.9%	63.8%
Working hours		
Not working	16.2%	55.5%
1-20 hours	32.6%	28.2%
20-40hours	44.9%	16.3%
More than 40 hours	6.3%	8.7%

Internal consistency

A reliability analysis was conducted for each set of scales. The Cronbach's coefficient alpha for each scale was calculated to examine internal consistency of the measures and subscales. Most of the scales were shown to be reliable as well as homogeneous in both groups. Nine of thirteen subscales from the American survey had Cronbach's **coefficient alphas** above .80, and four scales had coefficient alphas above .70. Additionally, in the Korean group seven of thirteen had coefficient alphas above .80, and five had coefficient alphas above .70. Although most of the Korean scales were still acceptable, Study Aids should be rechecked and modified due to a low reliability coefficient (α =.54). For example, Study Aids of the Korean group (α = .54) was lower than that of the American group (α = .74). The result of exploratory factor analyses suggested that there were sub-dimensions in the Study Aids scale for the Korean students and they responded distinctly different among three subscales (see Table 3). When comparing to the American group, the Korean community college students frequently used internal resources in the materials for study aids (e.g., using italics and headings in a textbook). However, the Korean students were less likely to use human interaction study aids (e.g., meeting instructor or forming study groups) than the American community college students (see Table 4).

Table 3 Factor loadings from exploratory factor analysis on the items for Study Aids

Subscale/Item	Factor 1	Factor 2	Factor 3
Human interaction (face to face)			
I go to the college learning center for help when I am having difficulty learning the material in a course	.488	.338	-.414
I try to find a study partner or study group for each of my classes	.701	.182	-.107
If I am having trouble studying, I ask another student or the instructor for help	.665	-.105	.341
When I am having trouble with my coursework, I do not go to the instructor for help	.469	.044	.144
External resources (External material)			
If there is a website for my textbook, I use the information provided there to help me learn the material	.008	.859	-.026
If I am having trouble, I check my understanding by looking at other textbooks	.171	.750	.265
Internal resources (in the text book)			
My underlining is helpful when I review text material	.272	.072	.537
I use special study helps, such as italics and headings that are in my textbook	-.012	.132	.771

Table 4 Means, standard deviation for possible subscales of the Study Aids Scale

Study Aids Scale	Mean and SD for American (N=509)	Mean and SD for Korean (N=615)
Internal resources (in the text book)		
My underlining is helpful when I review text material	3.73(1.05)	3.88(1.00)
I use special study helps, such as italics and headings that are in my textbook	3.32(1.16)	3.73(0.81)
External resources (external material)		
If there is a website for my textbook, I use the information provided there to help me learn the material	2.75(1.21)	2.41(1.03)
Human interaction (face to face)		
I go to the college learning center for help when I am having difficulty learning the material in a course.	2.51(1.18)	1.77(0.89)
I try to find a study partner or study group for each of my classes.	2.83(1.15)	2.61(1.09)
If I am having trouble studying, I ask another student or the instructor (Senior) for help	3.53(1.09)	3.47(1.10)
When I am having trouble with my coursework, I do not go to the instructor for help	3.72(1.04)	2.98(1.11)

Due to low reliability coefficients and different characteristics related to Study Aids between the American and Korean community college students, I decided not to include Study Aids in the self-regulation strategies in the final proposed model.

Single Group Confirmatory Factor Analysis

Table 5 shows the results of a single-group confirmatory factor analysis of 48 items with nine factors, including factors, items, and standardized and unstandardized loadings for the American group and the Korean group. In addition, the means, standard deviations, and correlations between constructs are shown in Table 6 for the American group and in Table 7 for the Korean group.

Results from these analyses yielded a reasonable fitting model for both the American group (χ^2 = 100.74, p< .001, CFI = 0.97, TLI = 0.95, RMSEA = .07, SRMR = .04) and Korean group (χ^2 = 213.33, p< .001, CFI = 0.94, TLI = 0.90, RMSEA = .10, SRMR = .04). Because an acceptable range of fit indices was obtained, MG-CFAs were conducted to test the measurement invariance of the scales across groups as the next step.

Table 5 Unstandardized loadings (standard errors) and standardized loadings for motivation, cognitive learning strategies and self-regulation strategies factors

	American		Korean	
	Unstandardized(SE)	Standardized	Unstandardized(SE)	Standardized
Motivation				
Motivation	0.380(0.022)	0.705	0.425(0.026)	0.651
Attitude	0.566(0.025)	0.877	0.464(0.021)	0.806
Self-efficacy	0.358(0.029)	0.566	0.504(0.026)	0.731
FTO	0.341(0.029)	0.560	0.309(0.019)	0.641
Cognitive strategies				
INP	0.318(0.033)	0.495	0.349(0.024)	0.650
SMI	0.397(0.040)	0.519	0.346(0.023)	0.644
TST	0.355(0.033)	0.545	0.426(0.023)	0.743
Self-regulation strategies				
CON	0.559(0.030)	0.770	0.519(0.024)	0.830
SFT	0.532(0.032)	0.717	0.419(0.019)	0.824
TMT	0.597(0.030)	0.810	0.477(0.024)	0.732

Table 6 Means, standard deviations, and correlations for subscales in the American group

	ATT	CON	INP	MOT	SFT	SMI	TMT	TST	Self-efficacy	FTO	GPA
Mean	3.98	3.28	3.49	3.78	3.18	3.41	3.16	3.58	4.25	3.98	2.29
SD	0.539	0.734	0.645	0.654	0.752	0.763	0.739	0.651	0.638	0.609	1.101
ATT	1										
CON	.496	1									
INP	.251	.261	1								
MOT	.607	.570	.470	1							
SFT	.376	.394	.600	.591	1						
SMI	.322	.673	.243	.459	.279	1					
TMT	.503	.646	.358	.618	.590	.391	1				
TST	.395	.653	.195	.464	.281	.758	.391	1			
Self-efficacy	.449	.297	.200	.507	.310	.238	.287	.283	1		
FTO	.451	.319	.316	.461	.410	.150	.360	.224	.408	1	
GPA	.087	.163	.123	.229	.197	.099	.128	.150	.124	.174	1

Table 7 Means, standard deviations, and correlations for subscales in the Korean group

	ATT	CON	INP	MOT	SFT	SMI	TMT	TST	Self-efficacy	FTO	GPA
Mean	3.70	3.16	3.31	3.39	3.03	3.54	2.70	3.23	3.69	3.42	3.23
SD	0.654	0.625	0.584	0.576	0.509	0.538	0.652	0.574	0.691	0.482	0.610
ATT	1										
CON	.435	1									
INP	.352	.398	1								
MOT	.473	.632	.502	1							
SFT	.331	.543	.542	.535	1						
SMI	.306	.510	.423	.421	.471	1					
TMT	.240	.597	.379	.569	.606	.376	1				
TST	.281	.527	.485	.509	.550	.720	.492	1			
Self-efficacy	.553	.420	.411	.567	.414	.419	.327	.438	1		
FTO	.535	.349	.351	.468	.380	.334	.331	.365	.495	1	
GPA	.280	.293	.248	.347	.262	.258	.312	.278	.316	.244	1

Multi Group Structural Equation Modeling (MG-SEM)

Testing the Measurement Model (multi-group confirmatory)

MG-CFA is used to assess the measurement invariance of motivation, cognitive learning strategies and self-regulation strategies across the American and Korean community college students. Because it was verified that the fit of this measurement model was acceptable with the data on both the American and Korean community college students, I could estimate a joint unconstrained model. This model with factor loadings, intercepts and error unconstrained showed a good fit (χ^2 = 319.65, p< .001, CFI = 0.96, TLI = 0.93, RMSEA = .08, SRMR = .04).

The second step for testing measurement was conducted by examining the equivalence of indicator loadings (i.e., metric invariance) between the American and Korean groups by constraining all indicator loadings to equality across groups (χ^2 = 393.04, p< .001, CFI = 0.94, TLI = 0.92, RMSEA = .09, SRMR = .10). The difference in fit of the unconstrained model and the indicator-constrained model was compared via a χ^2 difference test, because the indicator-constrained model is nested within the unconstrained model. This test revealed a significant $\Delta\chi^2$, meaning that the unconstrained model was better than the indicator-constrained model (see Table 8). However, the χ^2 test is strongly influenced by sample size. In other words, the chi-square values are inflated due to large sample size (statistically significant), and thus might erroneously imply a poor data-to-model fit (Schumacker & Lomax, 2004).

Therefore, although Chi-square (χ^2) is very commonly reported measure of fit and is used for model comparison, I did not make a decision based on the χ^2 test only. Because all of the other fit indices indicated that this indicator-constrained model was acceptably fitted and the indicator-constrained model is a more parsimonious model, it was better to select the indicator-constrained model instead of unconstrained model.

The next step in the sequence pertains to constraining the intercepts for each observed variable to be equal across the American and Korean groups as well as the indicator loadings (scalar invariance). Again, the chi-square difference (between the fit of the indicator-constrained model and loadings and intercepts constrained model) test was significant and constraining all intercepts also resulted in a significant decline in fit according to CFI, TLI, RMSEA, and SRMR values (χ^2 = 750.97, p< .001, CFI = 0.87, TLI = 0.84, RMSEA = .13, SRMR = .13). Therefore, a decision was made to reject the loading and intercepts constrained model (full scalar model).

As the last step in this measurement model testing, a specification search was conducted to determine which intercepts should be allowed to freely vary between the American and Korean community college students and modification indices were used to guide the process. Constraints imposed on the intercepts were then relaxed, one-by-one, and the fit of the model re-assessed after the removal of the constraint on each non-invariant intercept. As a result, 3 intercepts (of SMI, TMT, and FTO) were allowed to freely vary between the two groups. This model with constrained factor loadings, and partially constrained intercepts showed an acceptable fit (χ^2 = 319.65, p< .001, CFI =

0.96, TLI = 0.93, RMSEA = .08, SRMR = .04). Although, the chi-square difference (between the fit of the indicator-constrained model and this model) test was significant, I decide to select this partial invariance model as my final measurement model.

Importantly, as noted by Byrne et al. (1989), full scalar invariance is not a necessary prerequisite for conducting further tests, such as a factor invariance and structure modeling, as long as there are only a few intercept variables that do not have the same intercepts across groups although this is not optimal and some other researchers (e.g., Meredith, 1993) argued that the establishment of scalar invariance (strong invariance) is essential if comparisons between latent mean scores are to be conducted. In the current analyses, this condition was met. Thus, a decision was made to accept this partial invariance model (three intercepts [mean] free and loading constrained model, see Table 8 and Figure 7) as the final measurement model.

Table 8 Goodness-of-fit indices for measurement models

Model	*df*	χ^2	CFI	TLI	RMSEA	SRMR	Δ*df*	$\Delta\chi^2$
American	27	100.74	0.97	0.95	.07	.04		
Korean	27	213.33	0.94	0.90	.10	.04		
Unconstrained model	51	319.65	0.96	0.93	.08	.04		
Only loading constrained	61	393.04	0.94	0.92	.09	.10	10	73.39**
Three intercepts (mean) free & loading constained	68	440.88	0.93	0.91	.08	.09	7	47.84**
Loading & intercepts constrained	71	750.97	0.87	0.84	.13	.13	3	310.09**

Note. CFI = comparative fit index; TLI = Tucker-Lewis Index; RMSEA=Root Mean Square Error of Approximation; SRMR=Standardized Root-Mean-Square Residual

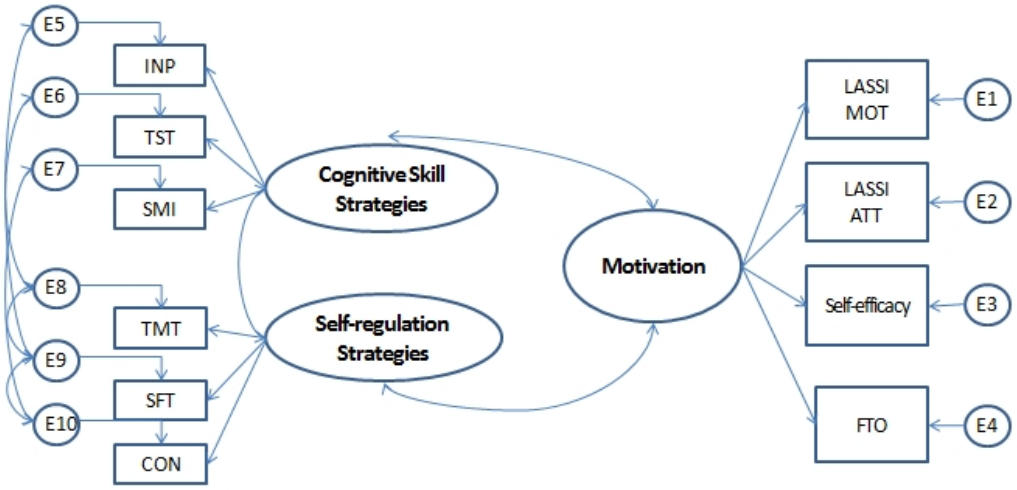

Figure 7 Final Measurement Model

Testing Factor Mean Differences

To test for significant differences in the factor means between the American and Korean community college students, the differences in latent means were estimated indirectly by fixing the factor mean scores to zero in the American group (reference group), while allowing them to be freely estimated in the Korean group. The estimated values for the factor means for both groups, as well as the difference in these means, are presented in Table 9. As the American group was assigned as the reference group, positive values indicate that the Korean group reported a higher mean value and negative values means that the Korean group reported a lower mean value than the American group. All hypothesized mean difference values were statistically supported as shown by Table 9. American community college students have higher scores on Motivation, use of cognitive strategies and use of self-regulation strategies. These test results

provided support for three research hypotheses: (1) American community college students have higher scores on motivation than Korean community college students; (2) American community college students have higher scores on use of cognitive learning strategies than Korean community college students; and, (3) American community college students have higher scores on use self-regulation strategies than Korean community college students.

Table 9 Factor means between the American and the Korean groups

Factor Mean (SE)	American	Korean	SE	*p*
Motivation ***	0.000	-0.875	0.189	0.000
Cognitive Strategies ***	0.000	-0.707	0.083	0.000
Self-regulation Strategies ***	0.000	-0.363	0.075	0.000

*** p<.01, *** p<.001*

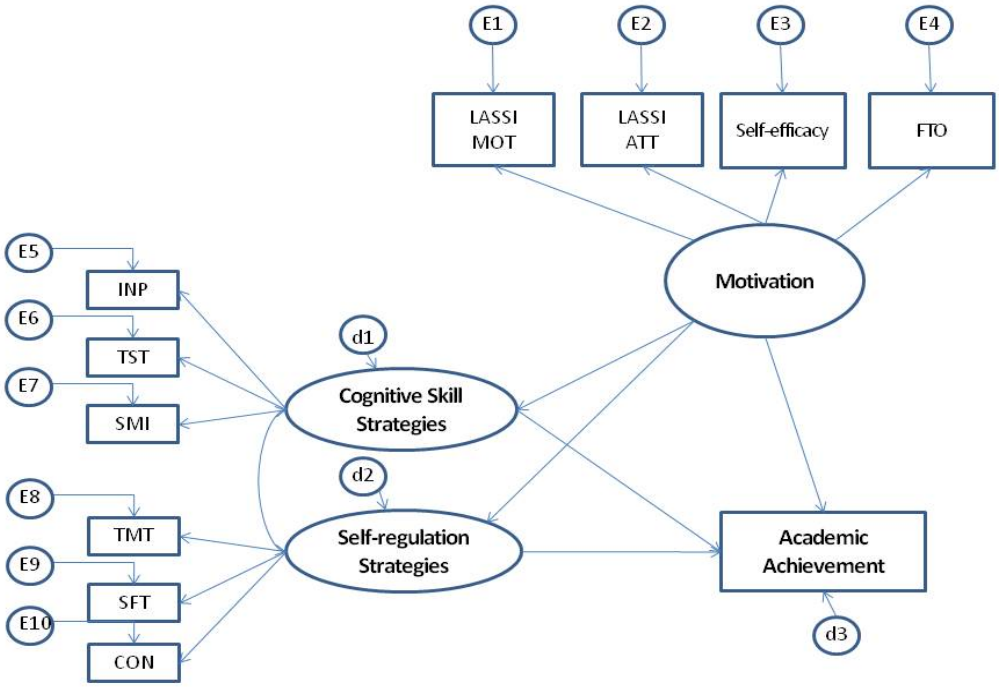

Figure 8 Structural model

Testing the Structural Model

After an adequate measurement model was developed, the structural parameters specifying the directionality between constructs could be tested. For the present study, the hypothesized structural model in Figure 9 served as an initial model to be tested for both American and Korean groups. Next, I used a constrained and unconstrained model to examine whether the structural model is the same across groups. However, before testing the measurement model, it is important to note that when the structural model is tested, all constraints placed upon the measurement model in the previous steps remained

in the structural model. The unconstrained model where path coefficients were unconstrained between groups showed a good fit (χ^2 = 392.91, p<.001, CFI = 0.94, TLI = 0.91, RMSEA = .08, SRMR = .09). In addition, the model with path coefficients constrained to be equal across groups showed an adequate fit (χ^2 = 464.97, p< .001, CFI = 0.93, TLI = 0.91, RMSEA = .09, SRMR = .10). Although the model with path coefficients constrained showed adequate fit, I tested another model with two unconstrained paths (MOT➔COG and MOT ➔ REG) in order to attain better fit. This model showed better fit than the fully constrained model (χ^2 = 452.72, p< .001, CFI = 0.93, TLI = 0.91, RMSEA = .08, SRMR = .09). Therefore, as shown in Figure 8, a decision was made to accept this partially constrained model (two unconstrained paths, also see Table 10) as the final structure model.

Table 10 Goodness-of-fit indices for structure models

Model	*df*	χ^2	CFI	TLI	RMSEA	SRMR	Δ*df*	Δ χ^2
Free to all structure parameter	74	392.91	0.94	0.91	.08	.09		
Two paths free model	84	452.72	0.93	0.91	.08	.09	10	59.18**
Fully-constrained structure model (all path constrain)	86	464.97	0.93	0.91	.09	.10	2	12.25**

*Note. CFI = comparative fit index; TLI = Tucker-Lewis Index; RMSEA=Root Mean Square Error of Approximation; SRMR=Standardized Root-Mean-Square Residual; ** p< .01*

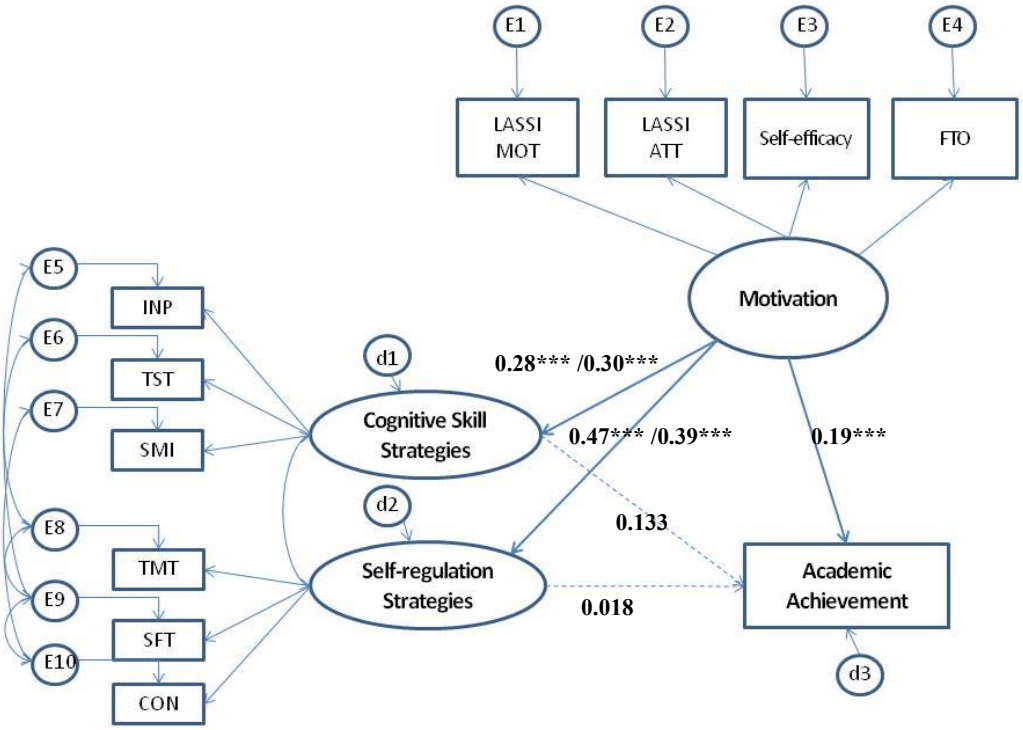

Figure 9 Final structure model

Directed Effects

Although this partially constrained model produced acceptable fit, not all structural parameters were statistically significant for both groups. Table 11 shows the estimated unstandardized and standardized direct effects for both groups separately. When the paths were constrained between groups, it showed the same unstandardized coefficients.

Table 11 Unstandardized and standardized path coefficients for the American and the Korean groups

	American		Korean	
	Unstandardized (SE)	Standardized	Unstandardized(SE)	Standardized
MOT ➔ COG	0.277(0.022)***	0.895	0.299(0.021)***	0.855
MOT ➔ REG	0.466(0.026)***	0.804	0.393(0.022)***	0.801
MOT ➔ GPA	0.191(0.069)***	0.174	0.191(0.069)***	0.350
COG ⇔ REG	0.026(0.005)***	0.543	0.026(0.005)***	0.486
COG ➔ GPA	0.133(0.250)	0.038	0.133(0.250)	0.085
REG ➔ GPA	0.018(0.107)	0.010	0.018(0.107)	0.016

*MOT = Motivation factor; COG = cognitive strategies factor; REG = Self-regulation strategies ** p< .01, *** p< .001*

These structure equation modeling results provided support for four research hypotheses: (1) Students' reported motivational variable scores had significantly positive effects on students' reported use of self-regulation strategies for both the American and Korean community college students. (2) Students' reported motivational variable scores had significantly positive effects on students' reported use of cognitive strategies for both the American and Korean community college students. (3) Students' reported motivational variable scores significantly positively predicted students' academic achievement for both the American and Korean community college students. (4) Students' reported use of cognitive strategies was positively related to students' reported use of self-regulation strategies for both the American and Korean community college students. However, these results did not provide statistical support for the four research hypotheses. (5) Student's reported use of cognitive strategies did not significantly predict students' academic achievement in the overall model for both the American and Korean community college students. (6) Student's reported use of learning skills strategies did not significantly predict students' academic achievement in the overall model for both American and Korean community college students.

CHAPTER 5

DISCUSSION

The purpose of this chapter is to provide an overview of the study findings and discuss theoretical and practical implications of the study. In addition, limitations of the current study and possible future studies are discussed.

Overview of the Study Findings

The goals of the study were to (a) propose a conceptual model based on theoretical frameworks of student use of cognitive strategies, use of self-regulation strategies, and motivation variables affecting student academic performance; (b) statistically examine each of the structural relationships among cognitive strategies, self-regulation strategies and motivation factors and student academic achievement (i.e., GPA for the current study); and, (c) test for cultural differences between American and Korean community college students on the measurement model, factor means, and structure model.

In general, the research model showed a good fit in both the American and the Korean groups after modification. This final SEM result partially supported the research hypotheses: student motivation had a significantly positive effect on students' reported use of cognitive strategies as well as self-regulation strategies for both American and Korean community college students. In addition, student motivation significantly positively predicted student academic achievement for both groups. However, students'

use of cognitive strategies and self-regulation strategies did not significantly predict student academic achievement for both groups.

In assessing for measurement invariance using MG-CFA techniques, a model was created to establish the relationships between the observed and latent variables. Once the model fit was acceptable for both groups when measured separately, equivalency constraints between groups were placed upon various parameters in the measurement model (i.e., intercepts, loadings). The hypothesis was that the strength of the indicator loadings to the factor and the intercepts of these indicators would be equivalent between American and Korean community college students. This hypothesis was partially supported, because the intercepts of three indicators were considered non-invariant between groups for better fit (i.e., partial invariance). According to Byrne and colleagues (1989), comparisons between factor mean scores could be conducted and advanced MG-SEM analysis performed to test structure invariance between groups although conditions are not optimal.

One of the important findings of this study is that factor means in the model were found to be significantly different between the American and Korean community college student groups. American students have higher scores on motivation and use of cognitive and self-regulation strategies. These results can be considered as evidence of cross-culture differences in community college student learning.

MG-SEM also demonstrated that the structural paths between the American and the Korean groups were partially equivalent. There are differences on the path from

motivation to cognitive strategies and the path from motivation to self-regulation strategies. However, generally, these findings indicated that the structure model fits almost equally well regardless of one's culture and nationality.

Implications

The most important finding of the study is that the current research model encompassing theoretical frameworks of students' cognitive, self-regulation, and motivational variables affecting student academic achievement is strongly applicable to both American and Korean community college students. This current research also showed several cross-cultural differences in students' use of cognitive strategies, self-regulation strategies and motivation.

There are significant differences between four-year college students and community college students on several characteristics such as college readiness and SES; since most of the theoretical concepts related to student learning have been studied and developed among four-year college students, their relevance to community college students has been questioned. This research contributes to providing empirical support for applying this theoretical framework and model, which many educators and researchers have developed for four-year college students, to community college settings.

In addition, the current research could contribute to generalizing the theoretical framework and a model of student cognitive, self-regulation, and motivational variables affecting student academic achievement to different cultures in other countries. Although a number of researchers have already found that a wide range of educational

and cultural variations could contribute to differences in student motivation and strategic learning strategies of Western and Asian students (Lihong, 2010; Purdie & Hattie, 1996, 2010), there is little research showing cultural differences in the model in order to make more comprehensible the relationships among motivation, cognitive strategies and self-regulation affecting student achievement. Furthermore, most cross-cultural researchers in post-secondary educational settings recruited participants from universities (especially, research universities). Those participants do not represent all people enrolled in a post-secondary education system. Therefore, conducting cross-cultural research with community college student groups could help with generalizing about the cross-cultural differences across various institutions.

Limitations

Although the present study is important for the reasons mentioned above, all empirical studies have limitations that should be addressed in order to guide interpretation and future research.

Is GPA enough to measure students' academic achievement

I used college grade point average (GPA) to measure student academic achievement. Although the use of GPA as a marker of academic achievement has been debated, some researchers showed the usefulness of GPA in measuring students' academic achievement and predicting future success. Practically, GPA is used in decisions about admission to professional schools and graduate programs, in employment decisions, and by the University in awarding distinction upon graduation. In addition,

some researchers already showed the true effect of GPA as a predictor of later success. In some cases, GPA is also positively correlated with success on the job (Harrell, 1969, 1970, 1972; Harrell, Harrell, McIntyre, & Weinburg, 1974). DeBerard et al. (2004) indicated that GPA strongly influences whether a student persists at a university. Because of the strong influence of GPA on both future career and retention, an examination of the study of factors which enable students to be academically successful continues to be worthwhile.

However, there are several limitations with student GPA when it is used as a marker of academic achievement.

First, there seem to be different grading standards in different types of college institutions. Several researchers provide evidence to support this limitation. For example, Goldman and Hewitt (1975) compared grading standards for students majoring in different fields. There were significant differences across majors. Part of the problem resulted from student's choice of class. Some students took easier courses based on other students' feedback, or took developmental courses, wherein they can get higher scores easily; other students took challenging or advanced courses, where it's harder to get higher scores easily. Therefore, it is difficult to compare GPAs because students take different classes and the grading practices vary across classes. In addition, it is hard to conclude that some students who have higher GPAs truly achieved a better academic performance than other students.

Second, college students' GPA is influenced by many factors and their interactions. The literature shows that there are many predictors that influence GPA, such as student's pre-achievement (SAT or High-school GPA; Plant, Ericsson & Asberg, 2005), working hours (Plant et al., 2005), personal background (family income, ethnicity, gender; Betts & Morell, 1999), social support (parent support and social supports; Phinney, Dennis, & Chuateco, 2005), student motivation (Zimmerman, 1989; Harackiewicz, Barron, Tauer, & Elliot, 2002) and student self-regulation (Garavalia and Gredler, 2002). Therefore, if a research study focuses on a single factor as a predictor of overall GPA, it will be difficult to find a significant dominant variable to explain a large amount of variance of GPA.

Issue of measuring students' use of cognitive strategies and use of self-regulation strategies

Cognitive strategies and self-regulation strategies can be used in a general domain as well as in specific contexts. For example, some college students use their self-regulation strategies for all courses they are currently taking. However, there is also a chance that students actually use their learning strategies differently in their different courses. One student might diligently use his information strategies in a biology course, but not in a mathematics course. Therefore, the effect of use of cognitive strategies and self-regulation strategies on students' achievement might shrink, but because of choosing not to use a strategy rather than because using a strategy did not

work. In addition, the survey was administered to entering students at the beginning of the semester. Therefore, students' reported use of cognitive and self-regulation strategies might be more related to the high school context rather than the college setting. It is possible that students' use of learning strategies in college might be different from high school.

Generalization

Although there is much research investigating student motivation and learning strategies affecting college student achievement, generalizations from prior studies might not hold true for different subgroups of students such as Asian, Latino, community college, 4-year college, or university students, where the dynamics among the variables in the model may be quite different. This current study could contribute to increasing both generalizability and specialization of results by observing different populations within western cultures as well as by doing cross-cultural research. Most cross-cultural research on college student learning has focused on 4-year university students. However, there are very different motivation levels and use of learning strategies across college levels. This research is distinguished from other cross-cultural research in these aspects, focusing on different venues, motivations and learning strategies use. However, there are several potential limitations of this research. Regarding administration of the study's survey, I tried to conduct this research with the same conditions in place as much as possible; however, there were some administration issues which might possibly affect

research results. The American survey was administered in the fall of 2007 to entering students during the first week of the semester as part of the CCLR project. The Korean survey was administered in the spring of 2010 to the entering class during the beginning of the semester (three weeks after school started), but not during the first week of the semester. Because they were not done at exactly the same time, survey results may vary due to this potential confounding.

There is another issue regards sampling because I obtained a relatively large sample size at both the American and Korean community colleges. However, I was able to administer the survey at only a single community college in each country. The group differences could be caused by culture differences or by institution characteristics. In order to generalize safely, it may be necessary to administer the survey to different community colleges in different countries.

Cross-cultural differences vs. survey response style differences

Another issue is about survey response style differences between American and Korean students. For example, in my exploration of the data (Jung, Weinstein & Kim, 2011), it was found that there were large differences between the American and Korean community college students on the self-efficacy measure. This result seems to indicate that American community college students have much higher self-efficacy than Korean students. However, it is important to interpret this result carefully, because the difference may be due to a difference in culturally-appropriate response styles between

Americans and Koreans, rather than a true difference in levels of self-efficacy. Kagitcibasi, Berry, Segall, and Kagitçibasi (1997) proposed that Asians typically obtained lower scores on self measures such as self-efficacy because of "modesty bias,'' in contrast to Americans who respond from a societal context or approach more conducive to "self-enhancement." Although Asians may actually have high self-efficacy, they may report lower self-efficacy in order to demonstrate a more culturally appropriate modesty. Asian philosophy (Confucian) and Asian cultures (collectivistic) emphasize values of balance, modesty, and conformity to group norms, which results in most Asians hesitating to offer very different ideas or to stand out (Klassen, 2004). This belief and culture could impact participants' response patterns in the current research. Some researchers have already found empirical evidence of this. For example, Chen, Lee, and Stevenson (1995) found that Asian students were more likely to use the midpoint on Likert scales than Western students, whereas American students were more likely to use the extreme values than other culture groups. It is important to interpret cross-culture research cautiously, given these and other possible differences in response style.

SEM model

When constructing and testing the conceptual model using SEM estimation to assess the relationships among motivation, use of cognitive strategies, and use of self-regulation strategies affecting student academic achievement, theory was relied upon to determine the directionality of the relationships among constructs. The structural paths

in the model may suggest causal or temporal relationships between latent constructs, but due to the correlational nature of the data, the graphical sequence of the constructs can be rearranged without impacting the fit of the model. For example, rather than specifying that motivation predicts student GPA, the model fit would remain the same if the model was specified to assess whether changes in GPA lead to changes in student motivation. Although the fit would remain the same, many of these possible models do not make sense, because theory would rule out many illogical patterns of relationships between constructs. Therefore, it is necessary to understand the theoretical background to interpret SEM results.

Possible future studies

Based on the results of the current study, many future studies can be suggested. First of all, future studies need to have various measurements to assess student academic achievement. GPA is only one measure for student's academic achievement or success. Future research should consider alternative measurements such as peer or teacher evaluation, student's satisfaction, problem-solving ability in the context of the course student are taking, ability to transfer and so on. Researchers cannot avoid looking at student grades to measure their academic achievement. However, if research includes more alternative measurements to measure student success, research may avoid the limitation of using only GPA as student success. Especially for community college students, there may be more important goals than having a higher GPA (e.g., getting a

certificate or transferring to a four-year college). Depending on the institution, researchers need to consider other variables to measure student success.

Second, this research could be replicated in a single course and single domain. A student's motivation or use of learning strategies could differ across the course or domain. To verify this research model, researchers need to conduct the same study in a single course. A study like this may find a stronger relationship between latent variables and GPA.

Third, this research was conducted using only a single community college sample in each country. The group differences could be caused by culture differences or by institution characteristics. In order to generalize more safely, it is necessary to apply this survey to more community colleges in each country studied here and different countries.

Appendix A:

Demographic Information in San Antonio College Student Survey

1. Fill in your age _____

2. What is your sex?

   a) Male b) Female

3. What is your racial or ethnic identification (you can check up to 2)?

   a) American Indian or Alaska Native

   b) Asian

   c) Black or African American

   d) Hispanic or Latino

   e) Native Hawaiian or Other Pacific Islander

   f) White or Caucasian

4. What is the highest level of education obtained by your mother and father? (Mark one in each column)

   a) None

   b) Elementary school

   c) Some high school

   d) Completed high school

   e) Post high school education or training other than college

   f) Some college

g) 2-year community or junior college degree

h) 4-year college or university degree

i) Masters degree or other graduate degree

j) Don't know

5. Which of the following best describes your yearly family income?

a) Less than 14,999

b) 15,000-24,999

c) 25,000-34,999

d) 35,000-49,999

e) 50,000+

6. Is this your first time attending a college, university, or other post secondary school?

1. Yes b) No

7. During this semester, how many hours a week do you plan to work at a job?

a) None; I won't have a job

b) 1-10 hours a week

c) 11-15 hours

d) 16-20 hours

e) 21-30 hours

f) 31-40 hours

g) more than 40 hours

Appendix B: The Learning and Study Strategies Inventory (LASSI) in San Antonio College Student Survey

Read each statement and then bubble in a response according to the following key:

1	2	3	4	5
not at all typical of me	not very typical of me	somewhat typical of me	fairly typical of me	very much typical of me

1. I concentrate fully when studying.
2. I am unable to summarize what I have just heard in a lecture or read in a textbook.
3. I try to find relationships between what I am learning and what I already know.
4. I find it hard to stick to a study schedule.
5. In taking tests, writing papers, etc. I find I have misunderstood what is wanted and lose points because of it.
6. I am able to study subjects I do not find interesting.
7. When I decide to study, I set aside a specific length of time and stick to it.
8. Because I don't listen carefully, I don't understand some course material.
9. I try to identify potential test questions when reviewing my class material.
10. During class discussions, I have trouble figuring out what is important enough to put in my notes.
11. To help me remember new principles we are learning in class, I practice applying them.
12. My underlining is helpful when I review text material.
13. When it comes to studying, procrastination is a problem for me.
14. I set high standards for myself in school.

15. When I am studying a topic I try to make everything fit together logically.
16. I find it difficult to maintain my concentration while doing my coursework.
17. I only study the subjects I like.
18. When preparing for an exam, I create questions that I think might be included.
19. When I take a test, I realize I have studied the wrong material.
20. If there is a web site for my textbook, I use the information provided there to help me learn the material.
21. I have difficulty identifying the important points in my reading.
22. When work is difficult I either give up or study only the easy parts.
23. To help me learn the material presented in my classes, I relate it to my own general knowledge.
24. There are so many details in my textbooks that it is difficult for me to find the main ideas.
25. I review my notes before the next class.
26. I have difficulty adapting my studying to different types of courses.
27. I translate what I am studying into my own words.
28. I put off studying more than I should.
29. I get discouraged because of low grades.
30. Even if I am having difficulty in a course, I can motivate myself to complete the work.
31. I spread out my study times so I do not have to "cram" for a test.
32. My mind wanders a lot when I study.
33. I stop periodically while reading and mentally go over or review what was said.
34. I go to the college learning center for help when I am having difficulty learning the material in a course.

35. I feel very panicky when I take an important test.
36. I have a positive attitude about attending my classes.
37. I test myself to see if I understand what I am studying.
38. When I study for a test, I have trouble figuring out just what to do to learn the material.
39. Even if I do not like an assignment, I am able to get myself to work on it.
40. When they are available, I attend review sessions for my classes.
41. I would rather not be in school.
42. I set goals for the grades I want to get in my classes.
43. When I am taking a test, worrying about doing poorly interferes with my concentration.
44. I try to see how what I am studying would apply to my everyday life.
45. I have trouble understanding exactly what a test question is asking.
46. I worry that I will flunk out of school.
47. To help make sure I understand the material, I review my notes before the next class.
48. I do not care about getting a general education, I just want to get a good job.
49. I find it hard to pay attention during lectures.
50. I try to relate what I am studying to my own experiences.
51. I dislike most of the work in my classes.
52. I review my answers during essay tests to make sure I have made and supported my main points.
53. When studying, I seem to get lost in the details and miss the important information.
54. I use special study helps, such as italics and headings, that are in my textbook.
55. I am very easily distracted from my studies.

56. Even when I don't like a course, I work hard to get a good grade.
57. It is hard for me to decide what is important to underline in a text.
58. To help me learn the material, I complete at least some of the practice problems in my textbooks.
59. I do not have enough time to study because I spend too much time with my friends.
60. To check my understanding of the material in a course, I make up possible test questions and try to answer them.
61. Even when I am well prepared for a test, I feel very anxious.
62. I set aside more time to study the subjects that are difficult for me.
63. I do poorly on tests because I find it hard to plan my work within a short period of time.
64. During a demonstration in class, I can identify the important information I need to remember.
65. I am up-to-date in my class assignments.
66. When I am having trouble with my coursework, I do not go to the instructor for help.
67. I end up "cramming" for every test.
68. When I listen to class lectures I am able to pick out the important information.
69. When I am studying, worrying about doing poorly in a course interferes with my concentration.
70. I do not care if I finish college as long as I have a good time.
71. I try to find a study partner or study group for each of my classes.
72. Courses in certain subjects, such as math, science, or a foreign language, make me anxious.

73. When completing a problem-solving task, it is difficult for me to pick out the important information.
74. After a class, I review my notes to help me understand the information that was presented.
75. If I get distracted during class, I am able to refocus my attention.
76. In my opinion, what is taught in my courses is not worth learning.
77. If I am having trouble studying, I ask another student or the instructor for help.
78. I get so nervous and confused when taking an examination that I fail to answer questions to the best of my ability.
79. I find that during lectures I think of other things and don't really listen to what is being said.
80. Even when study materials are dull and uninteresting, I manage to keep working until I finish.

Appendix C: Help-seeking scale in San Antonio College Student Survey

Read each statement and then bubble in a response according to the following key:

1	2	3	4	5
not at all typical of me	not very typical of me	somewhat typical of me	fairly typical of me	very much typical of me

1. If I ask another student for help on something I do not understand, I want to be given the answer rather than an explanation of how to find the answer myself.
2. Even if I do not understand what is being taught in a class, I do not ask for help.
3. When I do not understand how to use a method or procedure presented in class, I ask someone to teach me how to do it on my own.
4. When I ask the instructor for help on something I do not understand, I want the instructor to give me the answer rather than explain it to me.
5. If I ask other students for help with something I do not understand, I want them to help me find the answer myself and not give the answer to me.
6. I would rather do worse on an assignment I do not understand than ask for help.
7. If I need help in a class, I only want as much help as necessary to complete the work myself.
8. When I have trouble completing an assignment for class, I do not ask for help.
9. Even when I think the work in my class is too hard to do on my own, I will not ask for help.
10. If I need help with a class assignment or homework, I ask another student to give me the answer rather than telling me how to do it myself.
11. When I ask an instructor for help, I want the instructor to give me hints or clues rather than the answer.
12. When I cannot do a homework problem, I skip it rather than ask anyone for help

Appendix D: Self-Efficacy scale in San Antonio College Student Survey

Read each statement and rate yourself on how likely you think that statement will apply to you at SAC. Do not rate the statements in terms of how you think you should rate an item, or how you think others would rate them. Please work as quickly as you can, and please complete all the items.

1	2	3	4	5
not at all likely	not very likely	somewhat likely	likely	Extremely likely

1. I will do well in my community college courses
2. I will finish my community college program, certificate, or degree
3. I will do well on my community college course assignments and tests
4. I will reach my educational goals

Appendix E: Future Time Perspective scale in San Antonio College Student Survey

Respond to each of the following statements by indicating how true each statement is for you.

1	2	3	4	5
not at all true	not very true	somewhat true	fairly true	very much true

1. I think it is more important to think about the present than it is to think about the future.
2. Final exams are too far away for me to think about them now.
3. I do not think much about the future.
4. I think that attending my classes this semester will help me reach my future goals.
5. I live for today and do not worry about the future.
6. I think about how my coursework will help me to reach my future goals.
7. For me, two months is a very long period of time.
8. I plan now for how I will finish all of my course projects and papers this semester.
9. Because I am too busy taking care of the present, I do not think much about the future.
10. Thinking about what I want in the future does not help motivate me to do my coursework now.
11. I think about how what I am doing today relates to my future goals.
12. Finishing my program, certificate or degree is too far in the future to help motivate me to get my coursework done now.
13. I do not create goals for the future.

14. When my coursework is difficult, thinking about my future goals helps me to continue working.
15. I think about where I want to be 5 or 10 years from now.

Appendix F: The Self-Regulation Questionnaire - Academic

in San Antonio College Student Survey

Respond to each of the following the questions in Sections A, B, and C below by indicating how true each statements is for you.

1	2	3	4	5
not at all true	not very true	somewhat true	fairly true	very much true

A. Why will I do my assignments?

1. Because I'll want the instructor to think I'm a good student.
2. Because I'll get in trouble if I don't.
3. Because it will be fun to do them.
4. Because I will feel bad about myself if I don't do them.
5. Because I want to understand the content in my courses.
6. Because that's what I'm supposed to do.
7. Because I will enjoy doing my assignments.
8. Because it is important to me to do my assignments.

B. Why will I work on my course work?

9. Because I will feel pressured by my instructors to get it done.
10. Because I want my instructors to think I'm a good student.
11. Because I want to learn new things.
12. Because I'll be ashamed of myself if it doesn't get done.

13. Because it will be fun.
14. Because that's the rule.
15. Because I will enjoy doing my course work.
16. Because it's important to me to work on my course work.

C. Why will I try to do well in my courses?

17. Because that's what I'm supposed to do.
18. So my instructors will think I'm a good student.
19. Because I will enjoy doing my course work well.
20. Because I will get in trouble if I don't do well.
21. Because I'll feel really bad about myself if I don't do well.
22. Because it's important to me to try to do well in my courses.
23. Because I will feel really proud of myself if I do well.
24. Because I might get a reward if I do well.

Appendix G:

Demographic Information in Myung-ji College Student Survey

1. 나이: _____세
2. 성별: _____ (1) 남자 _____ (2) 여자
3. 귀하를 포함한 모든 가족의 월평균 가계소득은(부모의 월평균 소득 포함):

_____ (1) 100 만원 미만 _____ (2) 100~200 만원 미만
_____ (3) 200~300 만원 미만 _____ (4) 300~400 만원 미만
_____ (5) 400~500 만원 미만 _____ (6) 500~600 만원 미만
_____ (7) 600~700 만원 미만 _____ (8) 700 만원 이상
_____ (9) 모름/무응답

4. 부모님중 한분이라도 대학 교육을 받으신 분이 계신가요?
_____ (1) 예 _____ (2) 아니오

5. 이전에 다른 곳에 대학을 다니신 경험이 있으신가요?
_____ (1) 예 _____ (2) 아니오

6. 현재 **한주**에 얼마나 많은 시간을 직장 혹은 아르바이트로 일을 하고 계십니까?

___ (1) 일을 하지 않는다 ___ (2) 1 – 10 시간
___ (3) 11 – 15 시간 ___ (4) 16 – 20 시간
___ (5) 21 – 30 시간 ___ (6) 31 – 40 시간

Appendix H: The Learning and Study Strategies Inventory (LASSI)

in Myung-ji College Student Survey

다음은 설문검사는 University of Texas 에서 개발된 학습기술 및 전략 검사(LASSI)입니다. 이 검사는 여러분이 대학에서 실제로 어떻게 공부하는지 묻는 문항들로 이루어져 있습니다. 이 질문들에는 옳고 그른 답이 없습니다. 한 문항에 대해 너무 오래 고민하시지 많고 가능한 솔직하고 빠르게 답변해주십시요.

1	2	3	4	5
전혀 그렇지 않다	대체로 그렇지 않다	보통이다	대체로 그렇다	매우 그렇다

1. 나는 공부할 때 최대한 집중한다.
2. 나는 시험문제의 출제의도를 잘 파악하지 못해서 감점을 당한다.
3. 나는 책을 읽을 때, 지금 공부하는 내용과 이미 알고 있는 내용간의 관계를 찾으려 한다.
4. 나는 공부 계획을 잘 지키지 못한다.
5. 시험을 잘 못 봤을때 실패원인을 분석하여 다음 시험준비에 활용한다
6. 나는 대학 공부가 따분하고 지루하다.
7. 나는 공부할 시간을 구체적으로 정해놓고 공부한다.
8. 강의실에서 강의에 최대한 집중할 수 있는 자리에 앉아 집중력을 높인다.
9. 나는 공부한 내용을 제대로 이해했는지 확인하지 않아서 개념간에 혼동이 생긴다.
10. 강의 시간에 토론을 할 때, 나는 필기해야 할 중요한 내용을 찾아내기가 어렵다

11. 강의 시간에 새로 배우는 개념을 더 잘 기억하기 위해 예전에 배운 내용과 연결시킨다
12. 복습할 때 도움이 되기 위해, 수업교재에 밑줄을 긋는다.
13. 나는 해야 할 공부를 지나치게 미룬다.
14. 나는 학업성취에 대한 기대수준이 높다.
15. 나는 공부할 때, 지속적으로 집중하기 어렵다.
16. 나는 대학 다니는 동안 성취하고 싶은 확실한 학업 목표가 있다.
17. 다음 내용으로 넘어가기 전에 이전까지 공부한 내용을 잘 이해했는지 확인한다.
18. 나는 시험을 볼 때, 시험에 잘 나오지 않는 내용을 주로 공부했다는 것을 알게 된다.
19. 강의를 더 잘 이해하기 위해 강의내용과 관련된 웹싸이트의 정보를 찾아 이용한다.
20. 나는 책을 읽을 때 요점을 파악하기가 어렵다.
21. 나는 어려운 내용을 공부할 때 쉽게 포기하거나 쉬운 부분만 공부한다.
22. 나는 공부하는 내용과 관련된 구체적인 예를 생각해 본다.
23. 나는 교수님이 수업시간에 강조하시는 부분을 기억하려고 애쓴다.
24. 수업내용을 복습할 때, 내가 잘 이해하지 못한 부분이 어느 부분인지 파악하려 한다.
25. 나는 다양한 과목을 들을 때, 각 과목에 알맞은 적절한 시험 공부 방법을 찾기 힘들다.
26. 나는 공부하는 내용을 내 방식대로 다시 표현해본다.
27. 나는 좋은 직장에 취직하기 위해 필요한 좋은 학점을 받지 못할까봐 걱정한다.

28. 나는 강의 내용이 어렵더라도 포기하지 않고 꾸준히 노력한다.
29. 나는 시험 직전에 몰아서 공부하기 보다는 평소에 공부 시간을 할애해서 미리 공부해 둔다.
30. 나는 공부하는 동안 딴 생각을 많이 한다.
31. 나는 책을 읽는 동안 가끔 멈추고 읽은 내용을 정리해본다.
32. 나는 공부하는데 어려움이 있으면 학교에서 이용 가능한 시설 (예를 들어, 학습센터나 학생 상담소) 에 가서 도움을 구한다.
33. 나는 중요한 시험을 볼 때, 지나치게 긴장한다.
34. 나는 강의에 빠지지 않고 출석하는 것이 중요하다고 생각한다.
35. 나는 내가 공부하고 있는 내용을 잘 이해하고 있는지 스스로 확인 해본다.
36. 나는 시험을 보는 동안 주어진 시간을 계획적으로 활용하지 못해서 시험을 잘 보지 못한다.
37. 나는 과제가 마음에 들지 않더라도, 최선을 다해서 과제를 마치려고 노력한다.
38. 나는 공부할 때 이해가 잘 안 되면, 참고자료를 찾아 활용한다.
39. 나는 내 전공 (또는 학부) 가 마음에 들지 않아 공부하는데 흥미가 없다.
40. 나는 학기를 시작하기 전에 받고 싶은 학점에 대해 목표를 세운다.
41. 나는 시험준비 할 때, 노력한 만큼 좋은 결과가 나오지 않을까봐 불안하다.

42. 나는 공부 내용이 내 일상생활에 어떻게 적용될 수 있을지 생각해 본다.
43. 나는 수업시간에 발표할 때 긴장한다.
44. 강의 내용을 이해했는지 확인하기 위해, 다음 강의 시간 전에 노트를 복습한다.
45. 나는 강의 시간에 집중하기 어렵다.

46. 강의를 들을 때, 강의 내용을 나의 배경 지식과 관련 지어 생각해 본다.
47. 나는 대부분의 강의내용이 마음에 안 든다.
48. 주관식 시험을 볼 때, 내 생각을 논리적으로 전개했는지 답안을 확인하고 제출한다.
49. 나는 공부할 때, 세부적인 내용에 치우쳐 중요한 내용을 놓칠 때가 있다.
50. 나는 강의 교재를 읽을 때 특히 굵은 글자체나 제목 등에 유의하며 공부한다.
51. 나는 공부할 때 주의가 쉽게 산만해진다.
52. 나는 공부와 상관없는 많은 유혹을 이기고 공부할 수 있다.
53. 나는 교재를 읽을 때 밑줄 그어야 할 중요한 내용을 결정하기가 어렵다.
54. 나는 내가 공부한 내용을 친구들에게 설명해 본다.
55. 나는 공강 시간을 공부에 잘 활용한다.
56. 나는 연습문제를 만들어 풀어보면서 강의내용을 잘 이해했는지 확인해 본다.
57. 나는 시험 준비를 충분히 했을 때에도 불안해한다.
58. 나는 효율적인 시험공부 방법을 알고 있다.
59. 과제를 제출할 때까지 최선을 다해 성실히 해낸다.
60. 나는 공부에 방해하는 것들을 공부 시작 전에 치워서 집중력을 높인다.
61. 나는 시험을 볼 때마다 벼락치기로 공부한다.
62. 내가 교재를 읽다가 중요하다고 생각했던 부분이 시험에 나온다.
63. 나는 성적에 대한 고민을 너무 많이 해서 공부가 방해될 정도이다.
64. 나는 대학 공부가 나의 장래에 도움이 될 것이라고 생각한다.
65. 나는 강의를 들을 때 같이 공부할 친구나 스터디 그룹을 찾는다.
66. 나는 책을 읽을 때 내용간의 관계를 찾아보며 공부한다.

67. 내가 강의시간에 배우는 내용은 배울만한 가치가 없다고 생각한다.
68. 나는 공부하다가 어려움이 생기면, 수업을 같이 듣는 친구나 선배에게 도움을 청한다.
69. 나는 시험을 볼 때 너무 긴장해서 내 실력을 최대한 발휘하지 못한다.
70. 강의시간에 주의가 산만해져도 다시 강의에 집중할 수 있다.
71. 나는 공부내용이 지루하고 재미없어도 계획한 부분을 끝까지 마친다.
72. 해야 할 공부와 일이 많아도 시간을 잘 관리해서 성공적으로 마친다.
73. 강의를 들을 때, 나는 중요한 내용을 구별해낼 수 있다.
74. 나는 논술형 시험을 볼 때 답안에 포함될 핵심 내용을 정리한 후 답안을 완성한다.
75. 나는 강의를 들으면서 질문이 생겨도 교수님께 여쭈어보지 않는다.
76. 나는 강의를 듣는 것이 재미있다.
77. 나는 시험일정이 발표되면 긴장되어서 마음이 안정되지 않는다.
78. 강의 교재에 세부적인 내용이 많아도 요점을 파악할 수 있다.
79. 나는 가장 효율적인 공부 시간을 찾아서 공부한다.

Appendix I: Help-seeking scale in Myung-ji College Student Survey

다음은 학업의 태도 및 동기 등에 관한 문항입니다. 가장 알맞은 곳에 응답해 주십시오.

1	2	3	4	5
전혀 그렇지 않다	대체로 그렇지 않다	보통이다	대체로 그렇다	매우 그렇다

1. 내가 잘 이해하지 못하는 것을 친구에게 묻는다면, 나는 친구가 문제해결방법보다는 바로 정답을 알려주기를 원한다.
2. 내가 강의에서 배운 것을 이해하지 못할 경우에 누구에게도 도움을 청하지 않는다.
3. 강의에서 제시된 방법을 어떻게 사용하는지 이해하지 못할 때,
4. 나는 다른 친구에게 그 문제를 내 스스로 해결할 수 있도록 도움을 요청한다.
5. 교수님에게 내가 이해하지 못하는 것에 대해 질문할 때, 나는 교수님이 그 문제에 대해 설명해 주시기 보다는 직접적인 답을 알려주시길 원한다.
6. 과제를 나 혼자 해나가기 너무 어렵더라도 남들에게 도움을 요청하지 않는다.
7. 내가 듣고 있는 학과목에 관해 도움을 요청할 때, 나는 누군가가 나에게 정답을 주길 원한다.
8. 만약 내가 과제를 해나가는데 어려움을 겪고 있다면 누군가가 나 대신 그 과제를 해주기 보다는 어떻게 하는지를 나에게 알려주기를 원한다.
9. 내가 강의에서 요구하는 과제를 하는데 어려움이 있을 때, 나는 도움을 청하지 않는다.

10. 내가 이해하지 못하는 것에 대해 친구에게 물어본다면 친구가 나에게 정답을 알려주기 보다 내 스스로 답을 찾을 수 있도록 도와주길 원한다.
11. 만약 내가 과제를 하는데 도움을 요청한다면, 나는 다른 친구들에게 어떻게 해결할지 방법을 묻기보다는 정답을 알려달라고 요청한다.
12. 내가 교수님께 도움을 청할 때, 교수님께서 나에게 정답보다는 정답에 이르는 힌트나 단서를 주시기를 원한다.

Appendix J: Self-Efficacy scale in Myung-ji College Student Survey

다음은 학업의 태도 및 동기 등에 관한 문항입니다. 가장 알맞은 곳에 응답해 주십시오.

1	2	3	4	5
전혀 그렇지 않다	대체로 그렇지 않다	보통이다	대체로 그렇다	매우 그렇다

1. 나는 수강하는 학과목들을 잘 해낼 수 있을 것이다.
2. 나는 내 전공에서 학위와 자격증 등 원하는 것들을 잘 마칠 수 있을 것이다.
3. 나는 학과목에서 요구하는 시험과 과제를 잘 해낼 수 있을 것이다.
4. 나는 내가 원하는 목표를 이룰 수 있을 것이다.

Appendix K: Future Time Perspective scale in Myung-ji College Student Survey

다음은 학업의 태도 및 동기 등에 관한 문항입니다. 가장 알맞은 곳에 응답해 주십시오.

1	2	3	4	5
전혀 그렇지 않다	대체로 그렇지 않다	보통이다	대체로 그렇다	매우 그렇다

1. 나는 미래에 대해 생각하는 것보다 현재에 대해 생각하는 것이 더 중요하다고 믿는다.
2. 나에게 기말 시험은 지금 생각하기에 너무나 멀게 느껴진다.
3. 나는 미래에 대해서 너무 깊게 고민하지 않는다.
4. 지금 듣는 수업들이 내 미래의 목표를 이루는데 도움이 된다고 생각한다.
5. 나는 미래를 위한 걱정보다는 오늘에 충실히 살아간다.
6. 내가 듣는 강의의 학습활동들이 미래의 나의 목표를 이루는데 어떻게 도움이 될 지에 대해서 생각한다.
7. 나에게 두 달이라는 기간은 굉장히 긴 시간이다
8. 나는이번 학기에 모든 강의의 프로젝트와 리포트들을 어떻게 마무리 지을지에 대한 계획을 가지고 있다.
9. 나는 현재에 상황을 해결하는데 너무 바빠서 미래에 대해서는 많이 생각하지 않는다.
10. 미래에 하고 싶은 일에 대한 생각들은 지금 내가 강의를 듣는데 동기를 부여해주지 못한다.
11. 나는 나의 미래의 목표를 위해 오늘 어떻게 살아갈지에 대해 생각한다.

12. 학위를 마치거나 자격증을 따는 것은 나에게 너무 먼 미래의 일로 느껴지기 때문에
13. 지금 강의에서의 수업 활동들을 해나가는데 동기를 부여해주지 못한다.
14. 나는 미래를 위한 목표들을 세우지 않는다.
15. 학과목이 너무 힘들 때, 내가 가지고 있는 미래에 대한 생각이 내가 이 일들을 계속 해나가는데 도움을 준다
16. 지금으로부터 5년 혹은 10년 뒤에 내가 되고 싶은 모습을 생각한다.

Appendix L: The Self-Regulation Questionnaire - Academic

in Myung-ji College Student Survey

다음은 학업의 태도 및 동기 등에 관한 문항입니다. 가장 알맞은 곳에 응답해 주십시오.

1	2	3	4	5
전혀 그렇지 않다	대체로 그렇지 않다	보통이다	대체로 그렇다	매우 그렇다

A. 나는 왜 강의에서 요구하는 과제를 해 나갈 것인가?

1. 교수님께서 나를 좋은 학생이라고 생각해 주시길 원하기 때문에
2. 내가 만일 이것들을 하지 않는다면 좋은 성적을 받을 수 없기 때문에
3. 이런 과제들을 하면서 재미를 느끼기 때문에
4. 내가 그것들을 하지 않는다면 나 자신에 대해 부정적인 감정이 들기 때문에
5. 강의에서 공부하는 내용들을 잘 이해하기 위해서
6. 이것이 내가 해야 할 일이기 때문에
7. 과제하는 것이 즐겁기 때문에
8. 과제를 하는 것이 나에게 중요한 것이기 때문에

B. 무엇때문에 나는 강의에서 요구하는 수업활동을 참여할 것인가?

9. 교수님으로부터 무언의 압박을 느끼기 때문에
10. 교수님께서 나를 좋은 학생이라고 생각해 주시길 원하기 때문에
11. 새로운 것을 배우기 원하기 때문에
12. 이것을 하지 않는다면 나 자신에게 실망할 것이기 때문에

13. 수업활동에 참여하는 재미있기 때문에
14. 이 강의의 규칙이기 때문에
15. 수업활동을 하는 것이 즐겁기 때문에
16. 수업활동을 하는 것이 나에게 중요한 것이기 때문에

C. 나는 왜 학과 수업에서 잘하려고 합니까?

17. 이것이 내가 해야 할 일이기 때문에
18. 교수님께서 나를 좋은 학생이라고 생각해 주시길 원하기 때문에
19. 이 강의가 즐겁기 때문에
20. 잘 하지 않는다면 좋지 않은 결과를 낳을 것이기 때문에
21. 잘 하지 않는다면 정말로 나 자신에 대해 부정적인 감정이 들기 때문에
22. 학과목에서 잘하려고 노력하는 것이 중요하므로

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Vita

JaeHak Jung was born in Seoul in the Republic of Korea on March 17, 1976. After graduating from Yangchung High School, Seoul, Korea, in 1995, he entered the Sungkyunkwan University, Korea where he received his Bachelor of Business Administration with a major in Industrial and Organizational Psychology in 1999. He entered the graduate school of Department of Psychology at Sungkyunkwan University in March 1999 and received a Master's degree in Psychology with an emphasis in Cognitive Psychology in 2001. In the fall of 2002, he entered the doctoral program of Educational Psychology at T he University of Texas at Austin with an emphasis on Learning, Cognition, and Instruction.

Since entering graduate school, he has built research experiences as a graduate student, research assistant, and assistant director of several research projects. He also has been an assistant instructor for three years for th e course of Individual Learning skills (ESP 310).

Permanent address (or email): 11521 Misty White Drive, Austin, TX 78717

This dissertation was typed by the author